Chem. Lib.

Vol. III MAY No. 5

1914

The Journal of the American Pharmaceutical Association

PUBLISHED MONTHLY
BY THE ASSOCIATION
AT COLUMBUS OHIO

W.J.N.

—THE STONEMAN PRESS—

62nd ANNUAL CONVENTION, AUGUST 24-29, DETROIT, 1914

Specify MERCK'S

"ORIGINAL PACKAGES"

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The Journal of the American Pharmaceutical Association

Volume III MAY, 1914 No. 5

Office of Publication, 79-89 North Third St., Columbus, Ohio.

Subscription, $4.00 per annum, within the United States. To Canada, $4.35. To other foreign countries in Postal Union, $4.50 per annum.

Entered at the Postoffice at Columbus, Ohio, as Second-Class matter.

A QUESTION OF PROFESSIONAL ETHICS.

"I PRACTICE in a small town and do a prescription business. I write, say a prescription for a cough. A neighbor or friend has a cough, they get the number off the bottle and take it to the druggist who fills it, knowing that the mixture was not prescribed for the person for whom he is now filling it. I told him [the druggist] not to do so. Has he a legal right to do this? This has happened so many times that I am ordering a small stock of drugs to dispense my most common remedies."

The above, being purely an *ex parte* statement of facts, does not present the qualifying or extenuating circumstances which the druggist might be able to set forth if given his day in court, and we shall therefore express no opinion as to his guilt or innocence of the offense as charged.

While there have been a few cases in the lower courts where the ownership of prescriptions has been under consideration, the writer has not been able to discover any authoritative ruling by a court of last resort upon the rights of physicians to control the fate of their prescriptions after they have been delivered to the patient.

In the absence of any legal authority one guess is about as good as another. A court might rule that the pharmacist was merely the custodian of the piece of paper upon which the recipe was written, and not the owner either of the paper or the recipe; or it might take the ground that the physician passed over all of his property rights to the patient and that the latter alone had the right to control the number of times the prescription should be refilled. To the writer it would seem to be a reasonable doctrine to regard the prescription as an order for a specific transaction, like a check on a bank, and that when the medicine has been compounded and delivered the virtue of the order is exhausted, except as a record of the transaction.

The question is of such importance that an authoritative ruling is much to be desired, and it would be a work of merit for some pharmaceutical society to join with some medical society in a friendly suit to determine the matter. The value of the decision would, of course, depend largely upon the manner in which the case was framed and the distinctness with which its several issues were set forth. One well considered decision by a state appellate court would no doubt be generally accepted as settling the subject until set aside by positive legislative enactments.

It is because a proper spirit of professional comity has so generally controlled the relations of pharmacists and physicians that these have been permitted to go unregulated by statute. It is only when some exceptional case arises, like the present one, that they are brought into question.

The legal questions involved are, however, the least important part of the query.

By common consent it is agreed that the man who is merely "law-honest," that is, who recognizes only such obligations as the law imposes in set terms and definitions, is neither a good neighbor nor a desirable citizen. And it is equally true that the druggist who measures his obligations to the medical profession and the public solely by the positive declarations of the statutes is neither a good citizen nor a desirable member of the pharmaceutical fraternity.

Upon what ethical or professional ground can a pharmacist justify his act in refilling a prescription, when such repetition has been expressly forbidden by the prescriber?

It is so common for physicians to give a patient verbal directions to have a prescription refilled that we believe pharmacists are justified in refilling them when they have no notice of any contrary desire on the part of the prescriber. But when the physician has plainly expressed the wish that a prescription shall not be refilled, then that wish must in every case be respected by the custodian of the prescription. This, it is believed, represents both the theory and the practice of the great majority of pharmacists. Any other rule would be a menace to the public health and direct invitation to reprisals by the medical profession.

That all druggists do not rigidly observe the rule of comity must be admitted with regret, but so far as the writer's observation extends the men of this class are comparatively few in number and far between. The majority of pharmacists are far too anxious to convince the prescribing physician of their trustworthiness to take any undue liberties in the way of refilling or in other respects.

In fact it would be difficult to explain or define the motives that could influence a pharmacist to deliberately disregard the prescriber's wishes concerning refills. Certainly it cannot be self-interest, since properly enlightened self-interest would dictate just the opposite course of conduct. When such things do occur, they can be due only to that mixture of general perversity, stupidity and petty meanness which is colloquially expressed as "pure cussedness."

If only the druggists who did such things were concerned, their punishment might safely be left to the physicians whose confidence they have betrayed, but unfortunately as things exist in this vale of tears, the innocent too often must suffer with the guilty, and all of the members of a class for the faults of a few.

Such actions make a mockery and a joke of the propaganda for better pro-

fessional comity. One deliberate disregard of a physician's request not to refill a prescription can do more harm than a dozen get-together meetings can remedy. To invite physicians to a propaganda dinner and meeting, and then conduct one's business in violation of professional ethics amounts to chucking them under the chin with one hand and clubbing them over the head with the other.

If ever thoroughly harmonious relations are to prevail between medicine and pharmacy they must come mainly through the growth of a good understanding and of a spirit of mutual helpfulness between them, and whatever will help in promoting this better understanding or make either profession more useful to the other is a desirable instrument of the propaganda.

If the pharmacist desires the confidence of the physician he must observe that confidence when extended; if he desires the patronage of the physician, either direct or through the medium of written prescriptions, he can obtain it by serving the physician better than any one else can serve him in the same line. Whenever this kind of service has been rendered it has resulted in the professional and financial prosperity of the pharmacist.

The extent to which the law can go in promoting these good relations between the two professions is limited. It cannot properly interfere merely to protect the business of the physician against the pharmacist, nor can it compel the physician to write prescriptions simply because the pharmacist needs the money. It can take cognizance of such things only so far as they are directly connected with the general public welfare.

For example, a statute might very properly prohibit the refilling of a prescription without the express permission of the prescriber, but this prohibition would not be for the purpose of giving the physician a monopoly, but for the reason that in many cases the continued use of a given medicine or its promiscuous passing around the community would be dangerous to the public health. Such a statute would simply be converting what is generally recognized as a professional obligation into a legal obligation which all would be compelled to observe.

Again, the law might properly prescribe that physicians who desired to dispense their own medicines should demonstrate their ability to do such dispensing before an impartial and unprejudiced board or commission, because the compounding and dispensing of medicines and their application to the treatment of disease are separate arts, and a man may be well qualified to practice one and not the other.

The physician is either qualified to dispense or he is not. If qualified, it should be easy to demonstrate that fact before an impartial commission; if he is not qualified, then the more reason why he should not be permitted to dispense. Here, however, we should not lose sight of the fact that there are different grades of compounding and dispensing. If the physician prefers to use tablets, serums, or other agents the preparation of which is completed before they reach his hands, it would be difficult to convince the average legislature that he should not be permitted to do so, unless it can be shown that the use of such medicaments will be productive of injury to the public.

Again the law might very properly require that the stock of drugs and medicines kept by the physician should meet the same requirements of purity and strength as are enforced with regard to the pharmacist.

Probably no one would claim that the physician ever deliberately purchases inferior or deteriorated drugs. When he does purchase them it is because he has been careless in selecting the source of supply, or because he has permitted some smart salesman to convince him that his cheap drugs are the equal of the higher priced ones of the well known manufacturer. Before the enactment of food and drugs laws, pharmacists sometimes "took a chance" on such propositions. If they do so now the chances are that they will be sorry.

There is no reason why the physician cannot have the best of everything if he is willing to pay the price and deals only with manufacturers or retailers of established reliability, and there is also no reason why the incautious ones among them should not be discouraged from taking chances, the same as pharmacists have been discouraged.

The only sound and permanent foundation for the satisfactory adjustment of the relations between pharmacy and medicine is the creation of mutual respect and mutual confidence between the members of the two professions. All that the statute law can do is to act as a palliative or as a corrective of the grosser abuses. Laws should not be specially constructed by physicians to curb pharmacists, nor by pharmacists to curb physicians. Measures designed to define the limits between medicine and pharmacy should be draughted by joint committees chosen from both—committees composed of men who are broad enough to realize that such a boundary line cannot be drawn as sharply as the lines on an architect's blue print, and who are ready both to give and to take in the compromise of disputed points.

J. H. BEAL.

<□>

UNITY OF EFFORT.

WE live in an age of activity. Everywhere there is the bustling movement of mankind, engaged in the desire for more business, for changed conditions in almost every walk of life,—in ethics, in politics, in social conditions and in every possible outlet for superabundant vitality, until one is almost tempted to ask at times, *"Cui Bono?"* Is it for betterment that the whole world is seething and fretting and fuming for change, some of these changes being those upon which the staid and sober citizen looks with askant eye?

For change does not always mean improvement and all activity is not for the best, all speed does not always win the race. We have Biblical authority for the statement that, "The race is not always to the swift," nor is excessive activity even in trade matters always for the best. In these, as in all other things of life, moderation accomplishes most in the end. It is of little service to the betterment of our profession to seek with confused effort to accomplish real and valuable things. Attempts looking toward reform should be made with calm, deliberate thought by which only the best results can be achieved. The cause of much confusion to-day is the lack of correlation between the minor organizations of the trade and the two great national bodies. Local organizations have a most useful place but would they not be more useful if they were organized as co-ordinate parts of a greater whole, and if all these bodies were striving for a common good? Con-

sider the strength which would be exerted by these various organizations if they were united in support of a common purpose, such as a model liquor law or a poison law such as might be framed by the able men of the national associations. See what a bulwark of defense would be a model law proposed by these men of national reputation and supported zealously all along the line by the united organizations of the trade. Now we fritter away our efforts in small-arm firing, but united we would wage our battle with the mighty projectiles of modern artillery.

See the good which has been accomplished through the unity of effort of the National Drug Trade Conference, and this same good would flow from any effort backed by the united trade in a like way. We would then have no such freak-legislation as cumber the statute books of many of our states to the great vexation of the members of the profession, but there would arise a sane and safe legislation which would result in good for all.

Why should not all these local organizations be parts of a greater whole? Be auxiliary to the A. Ph. A. and the N. A. R. D. and closely identified with them? Each of these bodies having its A. Ph. A. section and its N. A. R. D. section and each attracting to their meetings those interested in the special work of its sections? These two great national bodies are nobly doing their work in the advancement of pharmacy. But beneath these organizations there is confusion in which there is no unity of effort, from which lack, there results no wise progress. He who reads the reports of the various state associations, even with a careless eye, will hardly fail to observe that some give all their thought to the development of but one side of our profession, while others devote themselves almost entirely to the other side, few of them working for the harmonious development of the whole body, for that development which makes for the all-around good of the profession. Why should these associations so neglect the other side and seek for but the development of the one side? To be a pharmacist in these days requires a development along both of these lines. One must be commercial as well as scientific to be an all-around pharmacist. The pendulum must swing in sure and even beat for the clock to mark true and accurate time; if "out of beat" it may run, but without accuracy. So should we all endeavor to have the pendulum of pharmacy swing true for the proper development of the profession as a whole; for the development of its science and the development of its commerce and these can go hand-in-hand for the making of a nobler Pharmacy, a Pharmacy of the highest ideals and purpose.

ERNEST C. MARSHALL.

DETROIT, THE CONVENTION CITY.

The Detroit meeting of the A. Ph. A. in August promises to be in many respects the most delightful in the history of that venerable association.

It is worth a trip across the continent any time just to see Detroit, for beyond all question it is the most beautiful city in America. New York is awe-inspiring —and is sometimes said to be awful—Chicago is wonderful, Philadelphia, Boston and Washington are rich in historic associations, but in Detroit nature has done everything she could and Detroit folks have done the rest.

Most people do not realize that in the past fifteen years the population has practically doubled—that Detroit has changed from an overgrown town to a big city. The visitors here next August will see not only the greatest drug houses in the world, they will also see the greatest automobile, adding machine, varnish, stove and other manufacturing plants.

They will see the city whose building activities every year regularly outstrip every other city in America except New York, Chicago and one or two other of the most populous centers.

The local entertainment committee has almost completed its plans to make every hour enjoyable to the visiting A. Ph. A. members, but maintains a profound secrecy as to details. The complete program will be announced soon.

However, no one who has ever attended a big Detroit convention entertains any doubt about the recreational features of this meeting. The finest pleasure boats in the world are here and the variety of river and lake trips offered is limited only by the amount of time one has to spend that way.

And for those who would like a taste of motoring, the wide shaded streets and boulevards, the beautiful lake shore drive through Grosse Pointe, the millionaires' suburb, and the wonderful concrete roads extending in every direction through Wayne county will furnish a temptation too great to be resisted.

An easy two hours' run to the west by motor car brings one to Ann Arbor. Certainly it would be a mistake to leave Detroit without going there to see the great University of Michigan, whose school of pharmacy with its spacious and perfectly equipped laboratories contributes so much to the advance of pharmaceutical science.

This A. Ph. A. meeting offers the overworked druggist a rare opportunity for a week of improvement and recreation that should not be overlooked. Come along. Even if you are not a member of the Association, come anyway—you will be welcome.. The Association wants you. Detroit wants you. And it will be good for what ails you .

Scientific Section

Papers Presented at the Sixty-First Annual Convention

"LLOYD'S REAGENT"*—PRELIMINARY ANNOUNCEMENT.

JOHN URI LLOYD, PHAR. M.

The writer proposes to contribute to the 1914 meeting of The American Pharmaceutical Association (probably to the *Historical Section*), a paper concerning a newly discovered alkaloidal reagent, known to a few persons only, at this date, under the name "Lloyd's Reagent," the reagent itself being a form of Hydrous Aluminum Silicate. His paper will be devoted, mainly, to its discovery and application as an alkaloidal reagent, together with such connected features as appeal as being of interest, historically and otherwise. This delay of a year is necessary, not alone on the writer's account, but because a few chemists, microscopists and physicians have already instituted experimental processes in connection with special phases of the subject, and to their researches credit should be awarded.

The alkaloidal opportunities of this newly discovered reagent are shown by the specimens, herewith exhibited, of *Gelseminine* (ether soluble), natural alkaloid, and natural Nicotine. The first of these, a fixed alkaloid, is considered rare, and is generally accepted as difficult to obtain in quantity; the second is volatile, and prone, under most processes, to manipulative changes. To neither of these has any heat whatever, or any decolorizing agent been applied, the Nicotine being made without distillation.

With this preliminary note calling brief attention to the subject, the writer voices his hope that when comes the next meeting of this Association, he may be in a position to present a fairly comprehensive, as well as more satisfactory communication than is possible at this date.

REMARKS ON LLOYD'S REAGENT.

Remarks by J. U. Lloyd, on being asked to read the paper of Dr. Gordin and Mr. Kaplan on the Qualities of Lloyd's Reagent[1]:

I am naturally more than interested in what Dr. Gordin and Mr. Kaplan may say in this communication concerning this alkaloidal reagent, that is probably a new one to most members of our Society. I cannot refrain from expressing my thanks to both the authors of the paper and to the Society, in that I am privileged to read this paper, for I feel that I am highly honored in being thus selected. It

* See Dr. Sigmund Waldbott's announcement in the *Journal of the American Chemical Society*, June, 1913, and Dr. M. I. Wilbert's contribution to the Pennsylvania Pharmaceutical Association, reported in *The American Druggist*, July, 1913.

[1] Prof. Lloyd's remarks during the reading of this paper, as various phases of the subject were presented, are herein included.

would please me much were Dr. Gordin present with us, because I feel that the problems presented might lead to advantageous discussions, were he here. His absence, however, renders it permissible, and perhaps necessary, that I make some preliminary remarks concerning the reagent mentioned in the paper that I hold in my hand, as well as take the liberty of introducing, discreetly, a few comments as I proceed. It is with more than a little reluctance that even under these circumstances, I venture to intrude a few personal remarks, in directions that appeal to me as requiring special mention, but in it all I feel the authors will acquiesce.

The reagent to which Dr. Gordin refers in this paper, and which he calls simply, "Lloyd's Reagent for Alkaloids," is a form of hydrous aluminum silicate that I obtain from clay and earths. The most prolific source of supply that I have as yet discovered, is the well known "fuller's earth," which indeed carries in its crude form, most marked alkaloidal qualities. My experiences lead to the inference that the alkaloidal qualities of the material are not, however, due to the inorganic side of the compound, other than when combined with water. In fact, if the water be totally expelled from the hydrous aluminum silicate, all alkaloidal attraction disappears.

Another feature of the reagent that in a preliminary manner I need mention properly before reading this paper, is the fact that the *physical* form of the compound has much to do with its alkaloidal energy. In making and extracting this compound from the forms of clay that I have investigated, I have found it desirable, as nearly as possible, to bring the abstracted and hydrated material into a colloidal condition, in which form, before being dried, it has an intense affinity for alkaloids and alkaloidal salts. Indeed, the nearly transparent, practically colloidal form, is instantaneous in its action, there being scarcely an element of time between the absolute separation of any alkaloid yet investigated, whether in the form of salts or otherwise, from solution in water or acidulated water.

It may not be out of place for me to state that the contents of no two clays or specimens of fuller's earth seem to have the same *structural* qualities and affinities. The variations of the material obtained from different forms of fuller's earth are much greater than would be supposed to exist. The common blue clay of our hills and rivers, likewise carries qualities exceedingly variable.

Nor may it be out of place for me to state in connection with this paper of Dr. Gordin and Mr. Kaplan, that I have been bitterly disappointed in that clays that I, theoretically, supposed would be prolific in the yielding of the purest and strongest alkaloidal "attractives," but which proved to be the very reverse. Thus, the pure white aluminum silicate obtained from the Rookwood Pottery in Cincinnati, so celebrated for its beautiful wares, was found to be almost passive, when it came to the alkaloidal test.

It pleases me much to note in this paper, the comparison between charcoal and hydrate of aluminum, with my reagent. It shows that the length of time required for charcoal attraction, and the absence of alkaloidal qualities as concerns the hydrate of aluminum, agree with my experiences therewith. And also that the hydrated aluminum silicate (Lloyd's Reagent), for many bitters and different substances of drugs, has little, if any, attraction.

In making these remarks, which I feel due both to the writers of the paper and

to myself, as well as a privilege that I enjoy, I would like to add that Dr. Gordin uses the word "adsorption," as explaining the alkaloidal phenomena. Possibly he has accepted the word as employed by me in corresponding with him, and possibly he has made a scientific investigation to prove that it is altogether adsorption, or contact action, and not a chemical combination, after the manner of the usual alkaloidal reagents. Be this as it may, I wish to assume the responsibility of error of application, in case the doctor has used the word as taken from myself, and has thus been lead into accepting that view of the subject without personal investigation. Should it be shown by future experimentation that there is a chemical reaction other than adsorption, he, if the fault be mine, should be absolved from all responsibility therein.

Let me again express my deep regret that Dr. Gordin and Mr. Kaplin are not here to-day, to make a personal presentation of this paper to the Society, and let me again express my personal appreciation of the honor that has been extended me by the personal request that I read to the Society this contribution.

NOTE ON COMPARATIVE ADSORPTION OF DIFFERENT SUBSTANCES BY LLOYD'S REAGENT, ANIMAL CHARCOAL AND ALUMINUM HYDROXIDE.

H. M. GORDIN AND JAY KAPLAN.

Prof. John Uri Lloyd, in a private communication, informed me that he has discovered a reagent which quickly and completely adsorbs alkaloids from the aqueous solutions of their salts. The reagent is a natural aluminum silicate treated by a special method which he has patented in this country and will be patented abroad. Providing me with a liberal supply of the reagent, he asked me to verify his statement about the efficiency of the reagent for the complete removal of alkaloids, and gave me permission to institute upon the reagent any other set of experiments I might consider advisable. Since animal charcoal and freshly precipitated aluminum hydroxide are very much used for the removal of various substances from solution, I set up a series of experiments upon these two adsorbents along with Lloyd's reagent.

The results of my experiments, tabulated in the tables at the end of this note, may be summarized as follows:

1. The reagent resembles animal charcoal in possessing the power of adsorbing alkaloids, glucosides, bitter principles and coloring matter. While in the scope of adsorbable substances charcoal most probably excels Lloyd's reagent, in velocity of adsorption of alkaloids, the reagent by far surpasses charcoal. The complete removal of alkaloids by means of charcoal usually requires digestion with continuous shaking for several hours, while the adsorption by Lloyd's reagent is complete within a few minutes.

2. The removal of alkaloids by either the reagent or charcoal is not influenced by the presence of free acid in the solution. Even alkaloids which in the free

condition are soluble in water, such as colchicine and caffeine, can be completely adsorbed either by charcoal or Lloyd's reagent.

3. Aluminum hydroxide, so effective in the removal of acid dyes with which it forms lakes, has very little adsorptive power for alkaloids, glucosides, and bitter principles.

4. The amount of reagent or purified animal charcoal required for the complete removal of alkaloids differs with the nature of the latter, and in the case of charcoal the removal is not complete unless the digestion and shaking of the mixture lasts a certain length of time.

5. Sodium chloride is not adsorbed by Lloyd's reagent.

6. Both the reagent and charcoal adsorb acids and alkalies.

The experiments on alkaloids were carried out as follows: Solutions of alkaloidal salts or of alkaloids in acidified water were shaken with such quantities of reagent or purified animal charcoal and for such periods of time as were found by preliminary experiments to be in all cases sufficient for the complete removal of the alkaloids. The solutions were then filtered, and the acid or acidified filtrates tested with Mayer's and Wagner's reagents.

Berberine was also tested for by picric acid which is extremely delicate for this alkaloid, and for isocalycanthine the very sensitive test with gold chloride and sodium carbonate was used in addition to Mayer's and Wagner's reagents.

In working with aluminum hydroxide a comparatively large amount of aluminum sulphate was added to solutions of alkaloidal salts, and the liquids made strongly alkaline with ammonia. After shaking for some time, the liquids were filtered, and the filtrates tested as above.

In testing for the adsorption of salicin, amygdalin and aloin, the filtrates were examined by evaporating aliquot portions to dryness and weighing the residues.

In the experiments with sodium chloride the amount of the latter in the filtrate was determined by titration with standard silver nitrate.

In the experiments on the adsorption of acid and alkali the amounts of these in aliquot portions of the filtrates were determined by titration.

Another series of experiments were made in order to determine whether it would be possible to make use of either charcoal or Lloyd's reagent for the complete removal of an alkaloïdal salt in presence of free acid, together with a definite amount of this acid. If this were possible, we would have here a convenient method for the quantitative determination of alkaloids. All we would have to do would be to dissolve the given alkaloid in an excess of standard acid, remove the alkaloidal salt so produced together with a definite amount of the free acid by means of the adsorbent, and then titrate the excess of acid remaining in solution. Experiments showed, however, that both Lloyd's reagent and charcoal adsorb such amounts of free acids as are entirely independent of the amount of alkaloid taken. The acid adsorbed varies with the concentration of acid, alkaloid and amount of adsorbent used.

Attempts to make the method workable by standardizing the acids against known amounts of the alkaloids failed to give concordant results. Hence the expectations in this respect were not realized.

Table IV at the end of this article is taken from Lloyd's private communication.

TABLE I.

Adsorption of different substances by Lloyd's Reagent, Purified Animal Charcoal and Freshly Precipitated Aluminum Hydroxide.

Substance.	Amount.	Concentration.	Reagent Used.	Time shaken.	Wagner's reagent.	Mayer's reagent.	Special Considerations.	Conclusion.
Caffeine	.0945 gm.	15 cc.	2.5 gm. Lloyd's reagent	3 min.	no ppt.			
Caffeine	.0945 gm.	15 cc.	2 gm. charcoal	3 hrs.	no ppt.			
Caffeine	.035 gm.	10 cc.	10 gm. $Al_2(SO_4)_3+NH_3$	15 min.	heavy ppt.			
Colchicine	.0840 gm.	15 cc.	2.5 gm. Lloyd's reagent	3 min.	no ppt.	no ppt.		
Colchicine	.0840 gm.	15 cc.	2 gm. charcoal	3 hrs.	no ppt.	no ppt.		
Strychnine Sulphate	.0831 gm.	10 cc.	2 gm. charcoal	3 hrs.	no ppt.	no ppt.		
Strychnine Sulphate	.0321 gm.	10 cc.	6 gm. $Al_2(SO_4)_3+NH_3$	15 min.	no ppt.	no ppt.		
Berberine Sulphate.	.0333 gm.	20 cc.	5 gm. Lloyd's reagent	5 min.	no ppt.	no ppt.	no test with Picric acid	
Berberine Sulphate.	.0333 gm.	10 cc.	10 gm. $Al_2(SO_4)_3+NH_3$	10 min.	heavy ppt.	heavy ppt.	filtrate still yellow	adsorption very incomplete
Morphine Sulphate.	.0520 gm.	10 cc.	2 gm. charcoal	3 hrs.	no ppt.	no ppt.		
Atropine Sulphate..	.0575 gm.	10 cc.	2 gm. charcoal	3 hrs.	no ppt.	no ppt.		
Brucine Sulphate...	.0415 gm.	10 cc.	2 gm. charcoal	3 hrs.	no ppt.	no ppt.		
Aloin	.0418 gm.	10 cc.	5 gm. Lloyd's reagent	5 min.			Aloin present .010 gm.	adsorption incomplete
Aloin	.0418 gm.	10 cc.	10 gm. $Al_2(SO_4)_3+NH_3$	5 min.			filtrate yellow and bitter	adsorption very incomplete
Aloin	.0418 gm.	20 cc.	4 gm. charcoal	3 hrs.			colorless and tasteless	adsorption complete
Salicin	.0577 gm.	20 cc.	5 gm. Lloyd's reagent	10 min.			filtrate contained .0213 gm. Salicin	adsorption incomplete
Salicin	.0577 gm.	10 cc.	10 gm. $Al_2(SO_4)_3+NH_3$	15 min.			filtrate intensely bitter	adsorption very incomplete
Salicin	.0577 gm.	20 cc.	4 gm. charcoal	3 hrs.			filtrate tasteless	adsorption complete
Isocalycanthine	.0655 gm.	15 cc.	3 gm. Lloyd's reagent	3 min.	no ppt.	no ppt.	no result upon adding $Na_2CO_3+AuCl_3$	adsorption complete
Isocalycanthine	.0655 gm.	15 cc.	3 gm. charcoal	3 hrs.	no ppt.	no ppt.	no result upon adding $Na_2CO_3+AuCl_3$	adsorption complete
Amygdalin	.2786 gm.	20 cc.	3 gm. Lloyd's reagent	5 min.			residue weighed .0613 gm.	adsorption incomplete
Indigo	.1014 gm.	20 cc.	5 gm. Lloyd's reagent	15 min.			filtrate colorless	adsorption complete
Indigo	.1014 gm.	20 cc.	10 gm. $Al_2(SO_4)_3+NH_3$	15 min.			filtrate colorless	adsorption complete
Indigo	.1014 gm.	20 cc.	4 gm. charcoal	3 hrs.			filtrate colorless	adsorption complete
Sodium chloride....	2.5 gm.	100 cc.	5 gm. Lloyd's reagent	5 min.			titrated with $AgNO_3$	no salt adsorbed

TABLE II.

Adsorption of Acid and Alkali.

Substance.	Reagent.	Time of shaking.	Amount of substance adsorbed.
50 cc. N/10 KOH+50 cc. H_2O.....	3 gm. Lloyd's reagent	5 minutes	8.91 cc. of N/10 KOH
50 cc. NH_3 sol. 0.2%+50 cc. H_2O..	3 gm. Lloyd's reagent	5 minutes	2.82 cc. of NH_3O.2%
30 cc. N/10 H_2SO_4+50 cc. H_2O....	3 gm. Lloyd's reagent	3 hours	7.8 cc. N/10 H_2SO_4
50 cc. N/10 HCl+50 cc. H_2O.....	3 gm. Lloyd's reagent	3 hours	12.61 cc. N/10 HCl
30 cc. N/10 H_2SO_4+50 cc. H_2O....	3 gm. charcoal	3 hours	6.79 cc. of N/10 H_2SO_4
50 cc. N/10 H_2SO_4+50 cc. H_2O....	3 gm. charcoal	3 hours	11.74 cc. N/10 H_2SO_4
50 cc N/10 HCl+50 cc. H_2O.....	3 gm. charcoal	3 hours	6.6 cc. of N/10 HCl

TABLE III.

Relation Between Alkaloid and Acid Adsorbed.

Alkaloid.	Acid.	Reagent.	Time shaken.	Amount of acid found to be in combination with alkaloid.	Conclusion.
.2506 gm. Morphine	N/10 H_2SO_4	7 gm. Lloyd's reagent	3 min.	3.48 cc. N/10 acid	No def. relation
.1002 gm. Morphine	N/10 H_2SO_4	7 gm. Lloyd's reagent	3 min.	.817 cc. N/10 acid	
.250 gm. Morphine	N/10 H_2SO_4	10 gm. charcoal	3 hrs.	2.342 cc. N/10 acid	No def. relation
.1002 gm. Morphine	N/10 H_2SO_4	10 gm. charcoal	3 hrs.	1.290 cc. N/10 acid	

TABLE IV.

(Lloyd's.)

Amounts of the reagent required for the complete removal of different alkaloids.

1 gm. Cocaine Hydrochlorate requires.....14 gm. of the reagent
1 gm. Strychnine Sulphate requires.....10 gm. of the reagent
1 gm. Morphine Sulphate requires..... 6 gm. of the reagent
1 gm. Brucine Sulphate requires..... 8 gm. of the reagent
1 gm. Codeine Sulphate requires..... 6 gm. of the reagent
1 gm. Cinchonine Sulphate requires.....10 gm. of the reagent
1 gm. Cinchonidine Sulphate requires.....11 gm. of the reagent
1 gm. Atropine Sulphate requires..... 8 gm. of the reagent
1 gm. Quinine Bisulphate (Neutral Solution).....10 gm. of the reagent
1 gm. Quinine Bisulphate (Acid Solution).....12 gm. of the reagent

NORTHWESTERN UNIVERSITY SCHOOL OF PHARMACY, Chicago, Ill., June 24, 1912.

TINCTURE OF CANTHARIDES—CONTINUED.

WILBUR L. SCOVILLE.

In 1910 I called the attention of this Association to the fact that the official Tincture of Cantharides is unwittingly misbranded, in that it does not and cannot properly represent the drug. Operating on four different samples of cantharides, by the official process, I found that 30%, 44%, 54% and 63% of the activity of the respective drugs used was represented in the tinctures. By using a menstruum of 10% Glacial Acetic Acid and 90% of alcohol, by volume, tinctures were prepared from three of these drugs which represented 81%, 87% and 91%, respectively of their activities.

This acid menstruum has been declared objectionable by some, though for what reasons I have thus far been unable to discover, since acetic acid is an excellent adjuvant to the action of cantharides.

Last year I presented a second paper on the subject in which the results of fifteen further attempts at making a representative tincture were shown. These experiments were made with menstrua composed of alcohol-acetone, alcohol-chloroform and alcohol-acetic ether, each being supplemented by the addition of 0.5 parts of acetic acid per 100 volumes, to free the cantharidin. The results showed an exhaustion of 26% to 46% by the usual percolation method, and 66% to 74% when the percolation was preceded by digestion at 40° to 50° C. The only conclusion from these experiments was that digestion is a very material aid to extraction, but even then the results were far from satisfactory. Furthermore the results were very puzzling, inasmuch as solvents had been used which were certainly capable of dissolving the cantharidin present, yet some had failed to extract any more than the best samples of a straight alcohol-menstruum. Also these results were less satisfactory than those obtained by direct percolation with a cold menstruum of alcohol-acetic acid.

In the present series, eighteen experiments have been made.

Since the beetles have shown a considerable indifference to alcoholic solvents under varying conditions, and even to mixtures of alcohol and chloroform, or alcohol-acetone and acetone-acetic ether, another line of attack was sought.

Reasoning humanly, a creature which could resist unlimited quantities of alcoholic liquids might succumb to hot water—a reasoning which had some support in the known effectiveness of boiling water in assaying the drug and its tincture, the following experiments were tried:

A—50 Gm. of drug, assaying 0.75% of cantharidin were digested with 25 cc. of diluted hydrochloric acid and 25 cc. of water for fifteen hours at a temperature of about 50° C., a reflux condenser being used. Then there were added 175 cc. of acetic ether and 275 cc. of alcohol, and the mixture macerated, with occasional shaking for two days, then filtered.

B—50 Gm. of the same drug were digested for fifteen hours with 25 cc. of diluted acid and 100 cc. of water, then 175 cc. of acetic ether and 200 cc. of alcohol were added and the mixture macerated two days before filtering.

C—50 Gm. of the same drug were digested with 25 cc. of diluted acid and

150 cc. of water for fifteen hours, then 175 cc. of acetic ether and 150 cc. of alcohol added, the mixture macerated during two days, then filtered.

Results—"A" Tincture (10% water) assayed 0.059 gm. per 100 cc.
"B" Tincture (20% water) assayed 0.066 gm. per 100 cc.
"C" Tincture (30% water) assayed 0.057 gm. per 100 cc.

These show an exhaustion of 78.6%, 88.8% and 76.0%, respectively, and indicate that the beetles yield in some degree to the hot water treatment, but that there are limits to which the menstruum can be diluted with water and still retain the cantharidin in solution.

The rest of the experiments were therefore conducted on this line, striving for conditions that would give a tincture which would fully represent the drug.

Experiment D tried 25% of acid-water and yielded 0.060 gm. cantharidin per 100 cc. or 80% exhaustion.

Experiments E, F and G were made to determine whether chloroform or acetic ether would give the best results in the menstruum.

These were made on a drug assaying 0.70% of cantharidin. E was made with 25% of acid-water and 35% of acetic ether (by volume) in the menstruum, and F with 25% of acid-water and 20% of chloroform. G was made with 25% acid-water and 20% acetic ether.

"E" Tincture assayed 0.054 gm. per 100 cc.=77.1% exhaustion.
"F" Tincture assayed 0.053 gm. per 100 cc.=76.0% exhaustion.
"G" Tincture assayed 0.057 gm. per 100 cc.=80.0% exhaustion.

This shows the perversity of the insects and leads to no conclusions.

Experiment H, made on the drug assaying 0.75% of cantharidin, used 35% of acid-water and 35% of acetic ether in the menstruum. Results=0.057 gm. per 100 cc. or 76% exhaustion—the same as C.

Experiment I, used the same drug and menstruum as C, but added the acetic ether to the hot aqueous mixture, shook until cold then added the alcohol and macerated the whole four days. Results=0.060 gm. per 100 cc. or 80% exhaustion—a trifle better than C.

Experiment J, used 25% water (including 50 cc. of acetic acid per 1000) and 20% of chloroform, and the same method as I—that is, the hot aqueous mixture was shaken with chloroform until the mixture became cold (about fifteen minutes) then the alcohol was added and the mixture macerated four days. Results=0.074 and 0.077 gm. per 100 cc., or 100%!

Victory at last! Here was a tincture which fully represented the drug used, and a drug of good grade, too. It had a brownish-green color, was a little darker than the present U. S. P. tincture and had a noticeable odor of acetic acid and of chloroform—though the latter was not as prominent as I had expected. It was brilliantly clear, and did not precipitate on standing several months—as ascertained afterward.

This was the first tincture in my experience which was known to fully represent the drug, and it only remained now to prove that the process would apply to various grades of drugs.

For the next experiment (K) an exceptionally rich drug was employed—one assaying 0.92% of cantharidin. The menstruum consisted of 25% water and

20% chloroform with acetic acid as the freeing agent and the chloroform added directly to the hot aqueous mixture and shaken until cold, as in experiment I. Result 0.064 gm. per 100 cc. or 70% exhaustion! This is tobogganing with a sharp start!

Experiment L.—Again 25% acid-water and 15% chloroform, and the mixture was digested three days after the chloroform had been well shaken as before. Result, 0.0745 gm. per 100 cc., or 81% exhaustion. This is better, but still considerably below 100%.

Experiment M.—Twenty-five percent acid-water and 20% chloroform treated as L. Result 0.075 gm. per 100 cc. or 81% exhaustion.

Experiment N.—Same as L but macerated in the cold instead of digesting the final mixture. Result 0.072 gm. per 100 cc. or 78% exhaustion.

Experiment O.—Twenty-five percent acid-water, 15% chloroform and macerate six days after the chloroform and alcohol were added. Result 0.068 gm. per 100 cc. or 74% exhaustion.

Experiment P.—The drug used on Experiments K to O, inclusive, was in a moderately coarse powder—about No. 40. Now some of this was ground to pass through a No. 80 sieve, then treated with 25% acid-water and 20% chloroform menstruum, the water digestion being continued for two days, then the mixture macerated one day with heat and two days without. Result 0.064 gm. per 100 cc. or 70% exhaustion.

Experiment Q.—Same as P but with shorter digestion and maceration—three days total. Result 0.057 gm. per 100 cc.=62% exhaustion.

Experiment R.—Twenty-five percent acid-water—which was digested at about 50° C. over night (15 hours) then on a steam-bath at 95° to 100° C. under a reflux condenser for six hours, then cooled to about 70° C., the chloroform 15% added and the mixture shaken until cold. Then alcohol (55%) added and the mixture macerated three days. Result: 0.056 gm. per 100 cc.=60% exhaustion.

Experiment S.—Twenty percent water, 35% acetic ether and 45% alcohol, digestion with water at 50° C. carried on 24 hours, then maceration with the rest two days longer. Result: .065 gm. per 100 cc.=70% exhaustion.

Conclusions: I have none. This is still a continued quest,—the conclusion to follow.

The cantharides fly seems to be like the proverbial flea—"when you put your finger on him he isn't there."

There is some encouragement in getting one tincture that fully represents the drug, but that is of little value unless the formula can be depended upon. In this case it worked on one drug, and not on another. And lest somebody questions whether the assay on this sample was reliable, let me say that three assays on this particular lot checked to 0.3% and in all the experiments at least two assays were made, the results checking closely. Probably long practice has enabled me to make assays of this drug and tincture with reasonable accuracy, though I do not expect very close results among different operators by the present known methods.

The present situation on the extraction of cantharides is as follows:

1. Alcohol alone fails to extract more than half to two-thirds of the cantharidin present.

2. Heat favors extraction, but has less effect in anhydrous than in hydrated menstrua.

3. The best menstruum thus far found is a mixture of one volume of glacial acetic acid with nine volumes of alcohol.

4. Mixtures of water, alcohol and chloroform, acidulated with acetic or hydrochloric acid have given good results in some cases, but the proportions and method which will give uniformly satisfactory results have not yet been discovered.

PARKE, DAVIS & Co., Detroit, Mich.

DISCUSSION.

Otto Raubenheimer, of Brooklyn, said Mr. Scoville's work was certainly a valuable one, and proved without doubt that the Brussels International Conference had made a mistake when they made the international agreement that tincture of cantharides should be made 10 percent strength. Instead of using a menstruum of 70 percent alcohol by percolation, Mr. Scoville recommended making a glacial acetic acid menstruum, which seemed to extract the cantharidin and made a 100 percent tincture, by mixing one part of glacial acetic acid with nine parts alcohol. He thought this was a good means of extracting the cantharides. But at the same time it was doubtful whether it could be used, because frequently tincture of cantharides was administered internally, and especially as a veterinary remedy, for horses and cattle. He thought this formula was objectionable because of its high percentage of glacial acetic acid.

Mr. Scoville responded to this that in the official dose of tincture of cantharides the equivalent would be given. For instance, 5 minims tincture cantharides made with acetic menstruum equals 8 drops of ordinary vinegar; so even with a horse or other animal, where a relative amount was given, he did not see how it could be objectionable.

F. T. Gordon, of Philadelphia, wanted to know the effect of cantharides used as a hair tonic, and Mr. Scoville responded humorously that it was "a psychological effect only," inasmuch as there was no cantharidin really in these remedies.

L. F. Kebler, of Washington, D. C., wanted to know of Mr. Scoville on what basis he made the statement that the present pharmacopœial tincture of cantharides was misbranded, in view of the fact that this was recognized as standard in the Federal Food and Drugs Act.? The law declared that if it was prepared in accordance with the pharmacopœial method, it was a proper standard. He remarked that the results here stated brought to mind the possible reason why so many hair-tonics, said to be made with cantharides, had failed. He thought it was worth while to investigate this subject, for the benefit of mankind in general.

DETERMINATION OF SANTONIN IN SANTONICA.

CHARLES E. CASPARI, ST. LOUIS.

During the past winter, the fact was brought to my attention that Santonica was being bought and sold on its santonin assay, in fact, a certain manufacturer of stock remedies was in the market for Santonica with a guaranteed santonin content, claiming that he had always been able to procure such. At that time I knew of no published method for the determination of santonin and after correspondence and conversation with a number of my pharmaceutical-chemical friends, I learned that they knew no more than I did about the determination of santonin. I discovered that a firm of crude drug dealers in Chicago was assaying Santonica, but when I applied to that firm and requested it to give me

the method of assay, my request was politely but firmly refused, on the ground that this firm intended to take up the manufacture of santonin on a large scale and that its assay method would be the manufacturing process, which it desired to keep secret. About this time, our presiding officer, Mr. Frank R. Eldred, whom I take this opportunity of thanking, as well as the firm with which he is connected, Eli Lilly & Co., called my attention to three articles published in the Archiv der Pharmazie by Thaeter in Vol. 235, page 401 and Vol. 237, page 626 and by Katz in Vol. 237, page 245. Katz's article is a criticism of Thaeter's first article and some suggested improvements and Thaeter's second article is a reply to Katz.

I carefully and conscientiously endeavored to apply both the methods of Katz and Thaeter to the determination of santonin, but with very unsatisfactory results. Some santonin was always obtained, but an indeterminate amount was always lost on account of the large amount of resin that was precipitated with the santonin and the difficulty of separating the santonin quantitatively from the resin, so that it was impossible for me to obtain duplicate results that checked. About this time, my father, Charles Caspari, Jr., referred me to an article by Fromme, published in the Jahres-Bericht of Cæsar & Loretz of Hallé for September, 1912, for the determination of santonin in Santonica, which is a modification of Katz's method and which gave very satisfactory results. I take this occasion to say that I make absolutely no claim of originality in this paper, but merely desire to call the attention of the pharmaceutical-chemical profession to a quantitative method which I am sure is little known and which gives good results.

The method of Fromme follows: Thirteen grams of moderately finely powdered wormseed are placed in a separatory funnel containing 130 grams of chloroform. A pledget of cotton should be placed in the funnel above the stopcock before introducing the wormseed. After one hour's maceration with occasional shaking, 102.5 grams (equal to 10 grams of drug), of the liquid are drawn off into a 200 c. c. Erlenmeyer flask. Evaporate the chloroform until the residue weighs 7 to 8 grams. Add 100 grams of five percent barium hydroxide solution and place the flask in hot water. After the chloroform has evaporated sufficiently to enable the resin to rise to the surface, it is heated until all odor of chloroform has disappeared. Filter through a plain filter of six cm. diameter, previously wetted, into a 200 c. c. Erlenmeyer flask; rinse the flask and filter twice with 10 c. c. of hot water, add five grams of twenty-five percent hydrochloric acid to the filtrate and heat the whole for several minutes on a boiling water bath. After the liquid has been cooled somewhat by setting the flask in cold water, pour the liquid into a separatory funnel and rinse the flask with twenty c. c. of chloroform, which is added to the contents of the funnel. Shake the mixture actively for two minutes and after the chloroform has separated perfectly, filter the same through a double plain filter into a 100 c. c. Erlenmeyer flask. Wash the acid-aqueous liquid twice with fifteen c. c. of chloroform by agitation and draw the chloroform off as before through the filter. Distil the chloroform from the combined filtrate and remove the last traces of chloroform from the residue by a current of warm air. Dissolve the residue in 7.5 grams of absolute alcohol and add 42.5 grams of hot distilled water. Filter the milky

liquid at once into a tared 100 c. c. Erlenmeyer flask and wash the flask and filter twice with ten grams of a mixture of three grams of absolute alcohol and seventeen of distilled water. Set the filtrate aside for 24 hours (not longer) and filter through a plain six cm. tared filter, washing the flask and filter twice with ten grams of the above alcohol-water mixture. Dry the flask and filter at 100 degrees C. to constant weight, place in a desiccator for one-half hour and weigh again. To the weight of the santonin thus found add 0.04 gram for loss by solution in the dilute alcohol. The total weight of santonin multiplied by ten, gives the percentage content, which should be calculated on the basis of previously dried wormseed.

It may not be out of place to say a word in explanation of Fromme's method. Santonin is the inner anhydride or lactone of santoninic acid and probably occurs as such in the wormseed. The extraction with chloroform removes the santonin and considerable resin, while the treatment with barium hydroxide converts the santonin into barium santoninate, at the same time that the barium salt of certain resin acids is formed. The addition of hydrochloric acid sets free santoninic acid and also some resin acids. The heating on the water bath for several minutes serves to convert the santoninic acid into the lactone, santonin. This, together with some resin acids, is extracted from the acid liquid with chloroform and the chloroform is then evaporated. The residue is dissolved in absolute alcohol and enough hot water is added to make the alcohol fifteen percent strength, because it was found by experiment that alcohol of this strength was best adapted to dissolve the santonin while hot and to hold the least amount in solution when cold. When the alcoholic solution cools, the santonin separates out in crystals, while the resins separate out in such a fine state of division that they pass through the filter paper with the greatest ease. The addition of 0.04 gram to the amount of santonin obtained is made necessary because that amount of santonin is held in solution by the amount of fifteen percent alcohol used. In order to obtain concordant results, it is necessary to adhere rigidly to the amounts given in the method.

I have tried this method on two samples of Santonica, and, as stated above, I obtained very satisfactory results. The method is infinitely superior to that of either Thaeter or Katz. The results which I obtained on the two samples of Santonica were Sample No. 1, 2.09% and 2.21% and Sample No. 2, 2.46% and 2.33%. I have not had time to make more determinations, but the method worked so satisfactorily that I see no reason why it should not prove successful in the hands of any chemist.

In Vol. II, page 596, of the Journal of the American Pharmaceutical Association, LaWall calls attention to the fact that there is Santonica on the market which is practically devoid of santonin, and I wish to confirm this fact. There are large quantities of wormseed being imported into this country, in which the amount of santonin cannot be considered as more than the faintest trace and it is practically impossible to differentiate by inspection between the true and the spurious. Hence, it becomes necessary to have recourse to the quantitative method for the determination of santonin and fortunately we have a satisfactory method in the one of Fromme described above. It would seem desirable that this method be adopted by the government at the various ports of entry of this

country and that it also be incorporated in the forthcoming United States Pharmacopœia.

ANALYTICAL LABORATORY, MEYER BROS. DRUG CO., St. Louis.

DISCUSSION.

Clement B. Lowe, of Philadelphia, said that large quantities of crude santonin were being imported into this country, and he wanted to know whether it was possible that this santonica which seemed to yield no santonin had been treated, or could be treated, without altering the physical appearance of the drug. He was aware that this had been done with some drugs, as with opium, for instance, where a part of the morphine content had been abstracted and then the drug fixed up from that.

Prof. Caspari said it was true, that large quantities of crude santonin were imported, but the source was controlled by the Russian government, a close corporation, and he did not believe that the santonica that came in devoid of santonin had been subjected to treatment in the old country. Dr. H. H. Rusby had told him that the spurious article was a different species. Tons of this spurious species were being used all over the country, especially for stock-powders, which were absolutely worthless.

Hermann Engelhardt, of Baltimore, made the comment that out of ten samples of santonica he had examined, he had found nine with no trace of santonin whatever. He expressed the opinion that all of the tests given were uncertain.

Chairman Eldred said that, while it did not bear upon the determination of santonin, he was reminded to say that the representative of a drug importer had told him a few months before that he had considered the handling of santonin, and had gone to Russia to investigate the conditions of the market there, and he had found it just as Mr. Caspari has stated, that it was a very close corporation. An interesting fact was, that some of the growers were paid for their drug, which was then set fire to and burned in the fields, in order to keep from overloading the market with santonin.

DETECTION AND ESTIMATION OF MINUTE QUANTITIES OF FORMALDEHYDE IN PRESENCE OF HEXAMETHYLENAMINE AND OF METHYL ALCOHOL IN PRESENCE OF ETHYL ALCOHOL.

H. A. B. DUNNING, BALTIMORE.

Sometime during the year 1912, Dr. Curtis F. Burnam, member of the staff of Johns Hopkins Hospital, sought my advice as to the most satisfactory method of detecting traces of formaldehyde in urine.

After a careful investigation, I recommended, as most delicate and satisfactory, three tests herein named and described.

Only one of these tests, Rimini's, was of particular value in his work on account of the presence of hexamethylenamine in the material tested. Hehner's milk test, while most delicate, was not suitable on account of being conducted in acid solution, resulting in decomposition of hexamethylenamine with the production of formaldehyde.

While Rimini's test has been found to be most satisfactory in differentiation of formaldehyde in presence of hexamethylenamine, experience teaches that certain precautions should be observed to obtain best results.

The specimens to be examined and all test solutions should be warm, not hot,

and an excess of nitroprusside solution should be avoided. In weak specimens the nitroprusside solution should be diluted five to ten times. In urine, formaldehyde may be detected readily by this test in strength of 1-100,000; in weaker strengths than this, much depends upon the care and experience of the operator.

The test is usually conducted as follows: About 2 cc. of urine specimen, contained in five inch tube, is warmed and two drops of one-half percent fresh solution of phenylhydrazine hydrochloride is added, followed by two drops of one-half percent fresh solution of sodium nitroprusside, the mixture being made strongly alkaline with saturated solution of sodium hydroxide. In strengths 1-20,000 to 1-50,000, deep blue colorization results, changing in a few minutes to green, then yellow, or perhaps, red. In more dilute solutions the blue lasts momentarily only, and is quickly succeeded by green. The blue may be made to last longer and become more distinct by adjustment of the quantities of sodium nitroprusside and phenylhydrazine hydrochloride added, the weaker strengths requiring less nitroprusside and phenylhydrazine. In alkaline solutions phenylhydrazine gives a yellow color, therefore, if there is but a trace of formaldehyde the blue color is masked and converted into green by mixtures of blue and yellow.

The Phloroglucin test, the author of which I have lost record, is quite satisfactory for dilutions of formaldehyde in urine, not exceeding 1-100,000, the red color being masked by yellow of the urine. The author of this test directs that a solution of phloroglucin, 1 gram, alcohol 90 percent, 100 cc. and sodium hydroxide 10 grams, be made fresh. A much better plan is to prepare a solution of phloroglucin in alcohol 1 gram to 100 cc. and add strong solution of sodium hydroxide to specimen at time of testing.

The test is conducted as follows: To 2 cc. of specimen, previously warmed, contained in a five inch test tube, add one drop of alcoholic solution of phloroglucin, then make strongly alkaline with saturated solution of sodium hydroxide, previously warmed. The color produced is red.

These tests have been used with satisfaction in connection with an investigation made by Dr. Burnam and his associates. It seems to me desirable, in connection with this paper, to call attention to the character of Dr. Burnam's work and the importance of the conclusion arrived at.

Dr. Burnam has learned that small doses, as little as five grains per day, of hexamethylenamine may produce formaldehyde in the urine of strength exceeding 1-30,000, this being highly destructive to the mucosa of the bladder, while in other patients or, perhaps, at different times, one hundred grains per day will produce only traces of formaldehyde, or perhaps, none at all. The point of interest is that it is dangerous to give large doses of hexamethylenamine until the patient has first been treated with small doses.

Subsequent to the publication of Dr. Burnam's paper, much interest was evinced by the medical fraternity in the discovery of a test for the quantitative estimation of formaldehyde in the urine that would differentiate hexamethylenamine and yet would be practicable in the hands of the physician.

I offer the following test to fill this requirement: From an assayed specimen of commercial formaldehyde solution, accurate dilutions are prepared of strengths 1-50,000, 1-100,000, 1-200,000, 1-300,000, as standard solutions for

colorimetric comparison. More standard solutions may be prepared if necessary. The test will estimate quantitatively up to 1-500,000 in the urine and 1-30,000,000 in clear water. Dextrose, acetone, acetaldehyde do not interfere in solutions weaker than 1-30,000 and then only on heating or long standing.

The test is conducted as follows: To five cc. of the specimen contained in a five inch test tube, add .1 cc. of 15 p. c. solution of sodium hydroxide and mix well. Then add .1 cc. phenylhydrazine base, not hydrochloride, finally add .7 gram of stick sodium hydroxide and agitate for ten minutes. The strength is estimated colorimetrically by comparing with the standard solutions treated in same manner as specimen, and at the same time. It is important to remember that the several reagents must be added to specimen and standard solutions at the same time; i. e., specimen and standard are treated simultaneously.

Colorimetric comparisons must be made within twenty minutes after stick alkali is added. Usually comparisons are made in about ten minutes subsequent to the addition of stick alkali.

If it is desired to keep specimens for some hours previous to estimation, then the .1 cc. of 15 p. c. solution of sodium hydroxide must be added. This precaution prevents decomposition of hexamethylenamine with production of formaldehyde, which will take place in acid urine on standing. After specimen has been made alkaline as directed in method of assay, no attempt should be made to remove precipitate, as such procedure will remove free formaldehyde wholly or in part. In my experience any attempt to remove color of urine, by charcoal, precipitation, reduction, oxidation, etc., results in removal of some or all of free formaldehyde.

This test has been used with much satisfaction in a series of clinical experiments conducted at the Union Protestant Infirmary by Dr. George Walker, associate professor of Surgery, Johns Hopkins Hospital.

In line with the above work is a recent examination of samples of whiskey submitted by Dr. Hiram Woods, Eye Specialist, of this city. Dr. Woods stated that he was at that time treating a patient almost blind, who could offer no explanation of his condition except that he had partaken rather freely of whiskey mislabelled Sherwood Maryland Rye.

Upon investigating a sample of this brand of whiskey it was found to be a mixture of approximately 30 percent methyl alcohol, about 15 percent grain alcohol and 55 percent water. This sample was tested among other tests, including specific gravity of distillates, as follows:

A test tube partially filled with the sample was heated until vapor formed in upper part of tube, into which a copper spiral heated to redness and slightly cooled in air was plunged. The characteristic odor of formaldehyde and the effect on nasal passages was observed, masked to some extent by acetaldehyde and other odors. The formaldehyde odor was much more characteristic when applied to a fraction of distillate partially freed from water by saturating with potassium citrate and distilling the supernatant layer.

The specimen was further tested as follows: 100 cc. was supersaturated with potassium citrate and thoroughly shaken, when two strata of liquid were formed, the upper measured about 44 cc. This latter liquid was removed into a distilling bulb connected with a distillation tube having several bulbs and carrying glass

beads. The liquid was heated on water bath and began to boil at 68°-70° C., the larger portion distilling over under 75° C., rising to 78° then to 85°. The mixed distillate was twice distilled over lime, practically all coming over under 78° C. This distillate was then carefully fractionated, the lower boiling fractions being collected and refractionated until 19 cc. of liquid boiling at 60°-66° C. was obtained. This distillate tested with the copper spiral gave entirely characteristic formaldehyde effects.

Formaldehyde produced in solution by plunging a heated copper spiral into portion of distillate and testing in accordance with Rimini's Test, gave entirely characteristic reaction, as also Hehner's milk test, the phloroglucin test, and Dunning's test.

Methyl salicylate was produced with salicylic acid and sulphuric acid, but only a trace of iodoform could be produced. The quantity of methyl alcohol, 96 percent, was then estimated with a refractometer and by the method suggested by C. Simmonds in his notes on the determination of small quantities of methyl alcohol,* which are here given:

"Small proportions of methyl alcohol have hitherto been somewhat difficult to determine readily and accurately. Fairly good approximate results can be obtained by comparative experiments with the well known method of Riche and Baddy (Compt. rend., *80*, 1076 [1875]), or with Wolff's modification of Trillat's process (Ann. Inst. Pasteur, *1912*, 8), but these methods are lengthy and rather troublesome. The process described by Thorpe and Holmes (J. Chem. Soc., *85*, 1 (1904), gives good results when the quantity of methyl alcohol is not too small. It is not well adapted, however, for use when the proportion of methyl alcohol is less than about 2 percent of the ethyl alcohol, since the necessary subtractive correction (loc. cit., pp. 2, 3) may in such cases be equal to or may exceed the quantity it is desired to estimate. For determining very small portions of methyl alcohol the method is quite inapplicable. In such cases satisfactory determinations can be made by applying the principle of colorimetric comparison by Deniges' process for detection of methyl alcohol (Compt. rend., 150, 332 [1910]).

"The possibility of thus using the process is indicated by Deniges, (loc. cit., p. 833). The object of the present note is to give the procedure which the writer finds most suitable for utilizing the reaction quantitatively in general analytical work, as, for example, in examining spirituous beverages, medical tinctures, flavoring essences, and so forth.

"The alcoholic mixture is best purified, when necessary, either by the method of Thorpe and Holmes (J. Chem. Soc., *83*, 314 [1903]), or by other suitable means. It is then diluted with water or mixed with ethyl alcohol, as the case may require, until it contains 10 percent of total alcohol by volume.

"To 5 cc. of this prepared liquid contained in a wide test tube are added 2.5 cc. of permanganate solution (2.0 grams $KMnO_4$ per 100 cc), and then 0.2 cc. of strong sulphuric acid. When the reaction has proceeded about five minutes, 0.5 cc. of oxalic acid solution is added (0.6 grams crystallized acid per 100 cc.). On shaking the liquid becomes clear and nearly colorless. One cc. of strong sulphuric acid is now run in and well mixed with the solution, which is finally treated with 5 cc. of Schiff's reagent. A violet color is developed in the course of a few minutes unless mere traces of methyl alcohol were present, when twenty or thirty minutes may be required.

"This color is due, of course, to the reaction of the fuchsin solution with formaldehyde, produced by the oxidation of the methyl alcohol. A sufficient quantity of sulphuric acid is present to prevent the development of color with any acetaldehyde formed from the ethyl alcohol during the oxidation.

*Government Laboratory, London. Analyst 27, 16 (1912).

"A preliminary experiment carried out as described serves to detect the presence of methyl alcohol, if it is not already known, and to give some idea of the quantity. According to the indications thus obtained, another part of the prepared liquid is further diluted, if necessary, with ethyl alcohol of 10 percent strength until it contains from 0.001 to 0.004 grams of methyl alcohol in 5 cc; the experiment is repeated side by side with two or more standards for comparison. These contain 0.001, .002, 0.003, etc., gram of methyl alcohol in 5 cc. of 10 percent ethyl alcohol. The colors produced are compared in small Nessler tubes (25 cc.) or in a suitable colorimeter.

"With properly sensitive Schiff's reagent, 0.0003 gram methyl alcohol in the 5 cc. of liquid taken is readily detected. The best depths of color for comparison, however, are given by the formaldehyde produced in the manner described from quantities of 0.001 to 0.004 gram of methyl alcohol.

"It is convenient to keep a standard solution (1 gram per liter) of methyl alcohol in 10 percent ethyl alcohol. This is diluted as required with 10 percent alcohol to form the standards for comparison. This proportion of ethyl alcohol (10 percent) is a suitable strength for general work, as the distillates ordinarily obtained are stronger, and can be diluted down instead of having to be concentrated.

"The process has the advantage of (1) being rapidly executed, (2) requiring only a small quantity of material, and (3) being directly applicable to weak distillates. The degree of accuracy obtainable is shown by the following results of a typical series of experiments:

	Grams methyl alcohol per 100 cc.						
Present	0.005	0.028	0.044	0.072	0.100	0.500	1.000
Found	0.004	0.029	0.046	0.072	0.104	0.492	0.968

"Formaldehyde, of course, must be absent from the unoxidized solution of the alcohols, or else its effect must be determined and allowed for. Glycerol must also be absent."

The method of purification referred to is for the purpose of getting rid of other volatile substances, such as ether, chloroform, benzene, essentials oils, etc. Twenty-five cc. of the sample are diluted in a separatory funnel with water to 100-150 cc., enough salt added to saturate the solution which is then shaken vigorously for five minutes with 50-80 cc. of light petroleum (boiling below 60°), allowed to stand 0.5 hour, the lower layer drawn off and again extracted if necessary, the petroleum extracts washed with 25 cc. of saturated salt solution, the wash waters added to the main bulk of liquid which is then neutralized if necessary and 100 cc. distilled over. Experiment has shown that all of the alcohol is recovered in the first 100 cc. of distillate.

Sensitive fuchsin bisulphite solution is readily made according to the following formula: In 100 cc. of a saturated solution, less than 1 percent of basic fuchsin, dissolve sodium bisulphite 10 grams and when nearly colorless mix with purified animal charcoal and filter; a perfectly clear solution should result.

DISCUSSION.

Otto Raubenheimer, of Brooklyn, said that hexamethylenamine should be taken internally with caution, as he had learned by an experience in his own family, where the hexamethylenamine, instead of being taken three times a day, in five-grain doses was taken every hour. After the patient had taken five doses she was thrown into a great state of excitement, with impairment of vision, and it was necessary to call in a physician. This experience had

proven to him that hexamethylenamine should be taken inwardly with great caution. He thought that one thing might be stated in the paper by way of caution—a fact well known to chemists—that phenylhydrazine and sodium nitroprusside solutions should be freshly made, as they deteriorated very rapidly and that they should furthermore be protected from light.

METHODS OF ANALYSIS FOR CERTAIN PHARMACEUTICAL PREPARATIONS.

LINWOOD A. BROWN, PH. C., PHAR. D., LEXINGTON, KY.

In the course of a year's work in a laboratory devoted to the analysis of drugs and drug preparations, it often becomes necessary to devise new methods, or to modify old ones, for the analysis of certain drug products that do not have any commonly recognized methods.

So far as the author is aware, the following methods have not appeared in print, and my reason for calling your attention to them is the fact that perhaps someone else may have need for such methods.

DETERMINATION OF MORPHINE IN TABLETS.

Take a sufficient number of tablets to equal about four or five grains of morphine, place in a small Erlenmeyer flask of about 50 cc. capacity, add 10 cc. of water and a drop of dilute sulphuric acid and allow to dissolve. If the tablets are not entirely soluble, as determined by a previous test, place the powdered tablets in a 5.5 cm. plain folded filter and extract with distilled water, applied drop by drop, using if possible not more than 10 to 15 cc. of water.

Now add a few drops of cochineal or methyl red and sufficient ammonia to give neutral point, and then add ½ to 1 cc. of 10% ammonia in excess.

Place sample in an ice chest, preferably resting upon a cake of ice and allow to stand over night, when if precipitation has taken place properly, the morphine will appear as a fine crystalline precipitate. Filter into a weighed Gooch crucible, wash well with cold water, dry at 65° C. and weigh.

Place filtrate from above in a separatory funnel and extract five or six times with 30 cc. portions of a mixture of chloroform 3 parts, and alcohol 1 part, being careful to maintain a very slight excess of ammonia. Wash the united chloroform-alcohol solution of morphine twice with 5 cc. portions of water, and then extract the aqueous washings with an equal volume of chloroform.

Filter the chloroform-alcohol solution of morphine through a small filter wetted with chloroform, into a suitable flask and distill off all but about 10 cc. of the liquid, evaporate the remaining portion to dryness on the water bath, take up in neutral alcohol (2 or 3 cc.) add an excess of N/50 sulphuric acid (about 15 cc.), a few drops of methyl-red or cochineal as indicator and titrate excess of acid with N/50 KOH. Each cc. of N/50 acid consumed is equal to 0.006 gm. crystalized morphine.

Add weight of morphine found in filtrate by titration to that obtained by

gravimetric method and multiply this figure by 1.251 to get amount of morphine sulphate in sample used.

ASSAY OF EFFERVESCENT SOLUTION OF MAGNESIUM CITRATE.

In addition to such tests and observations as appearance, odor, precipitate, if any, gas pressure, sp. gr. at 25° C., volume of entire sample, sulphates, chlorides, etc., we make the following assay:

Free Citric Acid.

Having first determined the total volume of the sample, measure out exactly 15 cc., add an equal volume of water, and boil until free from CO_2, cool, add a few drops of phenolphthalein, and titrate with N/2 KOH.

Each cc. N/2KOH=.03475 gm. citric acid.

Total Citric Acid.

Evaporate the liquid remaining after determining "free citric acid" to dryness in a platinum dish, char thoroughly, take up residue in 20 cc. N/1 H_2SO_4, heat on water bath, filter through ashless filter, and wash filter thoroughly with hot distilled water, burn filter in same dish, and dissolve the small amount of ash in a portion of the filtrate, filter if necessary, wash thoroughly, cool, and titrate excess of N/1 H_2SO_4 with N/2 KOH, using methyl orange as the indicator.

Each cc. N/1 H_2SO_4 consumed=.0695 gm. total citric acid.

Each bottle of Solution Magnesium Citrate when made by the U. S. P. formula should contain 33.6 gm. U. S. P. citric acid, and 15 gm. magnesium carbonate, equivalent to not less than 5.76 gm. pure MgO., and 2.5 gm. potassium bicarbonate.

According to my calculations, we should have in a strictly U. S. P. preparation, 11.87 gm. free citric acid, 21.73 gm. combined citric acid, and 5.76 gm. MgO per bottle.

Determination of MgO.

Dilute 25 cc. of the sample with water to 100 cc. Measure out 25 cc. aliquots, place in wide mouthed Erlenmeyer flask, and determine MgO by A. O. A. C. method as given in Bulletin 107, revised, page 16.

Calculate to gm. MgO per bottle.

By means of the above method we obviate the disagreeable feature of precipitating the citrate as the lead salt and its subsequent manipulation as proposed by Street. (Report of Conn. Agric. Exp. Station, 1912, part 2, page 165.)

ASSAY OF SEIDLITZ POWDERS.

Weight of Powders.

Weigh each powder in the box, using as counterpoise a powder paper of the same kind used in sample, compute the average weight of both the "white" and "blue" powders, reporting maximum, minimum, and average weight.

Assay of "Blue" Powders.

(1) Determination of Sodium Bicarbonate. Place one or two of the "blue" powders in a mortar and reduce to very fine powder to thoroughly mix, transfer to weighing bottle, and weigh off duplicate samples of about 1.5 gm., transfer carefully to flask, add about 50 cc. of water and 10 cc. N/1 sulphuric acid,

and boil until free from CO_2, cool, add phenolphthalein and titrate excess of acid with N/1 KOH.

Each cc. N/1 sulphuric acid consumed equals 0.08343 gm. sodium bicarbonate.

(2) *Rochelle Salt.* Weigh off samples of exactly the same amount as were used in the bicarbonate determination, place in platinum dish and carefully ignite until all organic matter is thoroughly charred, cool, and thoroughly extract ash with hot water, filter, burn filter and dissolve residue, if any, in water and add to previous solution. Aqueous solution should be colorless and perfectly clear, otherwise sample has not been ignited enough and determination must be repeated. Add methyl orange to aqueous solution and titrate to neutrality with normal sulphuric acid.

Calculation. Owing to the fact that the soda bicarbonate has been determined along with the Rochelle salt in this method, a correction must be made for it.

If samples of the same weight have been used, subtract the amount of acid consumed in the bicarbonate determination, from the amount used in the last assay. This will give the amount of acid consumed by the alkalinity of the ash due to the Rochelle salt.

Each cc. N/1 sulphuric acid consumed in this determination after allowing for the bicarbonate is equivalent to 0.14009 gm. Rochelle salt U. S. P.

The "blue" powder should weigh 10.33 gm. and should contain 25% sodium bicarbonate and 75% Rochelle salt. Each "white" powder should weigh 2.25 gm. net, and consist of tartaric acid U. S. P.

TINCTURE OF IODINE.

It would seem, after all that has been said and written concerning this preparation, that little remains, however I wish to call your attention to a few methods that have given satisfaction in my hands.

Determination of Alcohol. A number of methods of procedure have been suggested for this determination, such as shaking with metallic mercury until iodine is decolorized, (Alcock, Proc. A. Ph. A., 1904, p. 583); adding sodium thiosulphate in slight excess and distilling from an alkaline solution, (Gane & Webster Chem. Abs., vol. 3, p. 2487); and Cameron (Analyst, 1902, p. 87), who suggests in place of caustic soda the use of iron filings.

As I have never seen the following method suggested I take the liberty of doing so, especially as the above mentioned methods have certain objections, such as slowness of action between the iodine and the mercury or iron filings, difficulty of distilling from an alkaline solution, contamination of distillate with iodoform and other volatile substances, etc.

Place about 70 cc. of distilled water in a 300 cc. Erlenmeyer flask, add about 1 gm. of "zinc dust" such as is used in Kjeldahl method for nitrogen, or sufficient to leave a decided excess after combining with the iodine, now add exactly 10 cc. of the tincture, observing the proper precautions as to temperature in measuring out sample, shake flask, and immediately connect up with a good condenser, worm condenser preferred, and provided with an efficient spray trap, and distill over nearly 50 cc. of distillate.

Make up to volume with distilled water at desired temperature, and determine

sp. gr. of distillate by means of a pycnometer, and from the sp. gr. thus obtained calculate the percent of alcohol.

The zinc dust serves two purposes, first it *immediately* combines with the iodine forming a colorless solution of zinc iodide, and second, the excess of zinc helps to make the solution boil smoothly.

Determination of Free Acid. After the titration of the iodine as in the U. S. P. method, add a few drops of phenolphthalein to the clear liquid and run in decinormal KOH until liquid has faint pink color. The use of starch solution in the determination of the iodine is not necessary, as the change from the yellow color of the iodine to the colorless solution is quite distinct, and the use of the starch paste interferes with the "free acid" titration.

In samples made with the full amount of potassium iodide, it should not require more than one or two drops of 1/10 normal KOH, while in a tincture made without potassium iodide, and a few weeks old it sometimes requires as much as 5.75 cc. of the solution for a 5 cc. sample, equivalent to 1.459 gm. absolute hydriodic acid per 100 cc. of tincture. Each cc. of decinormal KOH consumed equals 0.01269 gm. HI.

This process depends upon the fact that the products of the reaction between iodine and sodium thiosulphate are neutral, and the free hydriodic acid can be titrated with standard alkali.

Determination of Potassium Iodide. Measure out 10 cc. of sample into a weighed porcelain dish, and place on top of water bath, but not in direct contact with steam, and set fire to the alcohol vapors to prevent the iodine creeping over the edge of the dish. Allow to evaporate to dryness, moisten a few times with 2 or 3 cc. of dilute alcohol, evaporating to dryness each time, finally ignite at a low temperature, short of red heat, cool and weigh. Calculate grams potassium iodide per 100 cc.

This is essentially the same method as proposed by Lawall (Proc. A. Ph. A., 1907, p. 159) and is given here with a few modifications, simply to call attention to it as a satisfactory method for this determination.

Theoretically potassium iodide is the only non-volatile ingredient of tincture of iodine, though the iodine and alcohol may contain small amounts of non-volatile matter, sufficent to sometimes give a dark gray color to the residue. This, however, is not sufficiently great ordinarily to seriously interfere with its accuracy as a practical method. In case the residue is very impure, it should be dissolved in water and the iodide determined in the residue by means of Volhard's method.

DETERMINATION OF TOTAL ARSENIC IN FOWLER'S SOLUTION.

Owing to the fact that arsenic has a tendency to oxidize in alkaline solution, during the process of manufacture, or by age, it becomes necessary to know the total amount of arsenic present as well as that in the arsenious condition.

Weigh out sample of about 15 cc., add 5 cc. of dilute sulphuric acid (1:3) and 1 gm. of potassium iodide, dilute to 100 cc. and boil down to about 40 cc.; cool, add starch solution and remove excess of iodine by the careful addition of thiosulphate solution, neutralize excess of acid by the addition of sodium bicarbonate, and add 2 or 3 grams in excess.

Determine arsenic from this point by the U. S. P. method. The difference between the percent of As_2O_3 by the U. S. P. method and "total arsenic" calculated as As_2O_3 represents the amount of arsenic in oxidized form.

DISCUSSION.

Philip Asher, of New Orleans, referring to the method proposed by Mr. Brown of using both the gravimetric and the volumetric processes, asked, "Why not stop at the volumetric, and get the morphine content?" Referring to the author's method of determining the alcohol in iodine, he said he had used that method himself, and it was approximately correct, sufficiently so for all practical purposes, and it could be carried out in two minutes. He placed some alcohol in a graduated cylinder and added potassium carbonate. This was shaken thoroughly, and in a short while the alcohol was found lying out above the potassium carbonate, upon which he was making the determination.

Continuing, Mr. Asher said, referring to the author's determination of free acids by distillation, that, in the early '90s, he had carried on a series of experiments of this kind, and had gotten his free acids by determining the free iodine by the potassium iodate method. He started by adding sodium thiosulphate until all the free iodine was taken up, and then added a small amount of potassium iodate. The iodate, in the presence of hydriodic acid was split up into iodine. The number of cubic centimeters found, multiplied by five-sixths, and by the iodine coefficient gave the iodine that was converted into hydriodic acid. This gave an exact determination. The desired result was had, without going through the process of distillation.

Mr. Brown responded that in the determination of morphine by precipitation, and extraction of the residual morphine left in the "mother liquor," he got around the disadvantage of having to use a large amount of solvent, which would be necessary if *all* the morphine was extracted by means of an immiscible solvent.

He did not determine the "free acid" by distillation as had been suggested. If the titration method was used, all that was necessary to do was to add a little phenolphthalein indicator to the solution, after decolorizing with thiosulphate, and titrate with tenth normal alkali to get the free acid, the product of the reaction between the thiosulphate and the iodine being neutral.

THE STABILITY OF OUABAIN IN AQUEOUS SOLUTION.

CHAS. C. HASKELL AND W. A. DOEPPERS.

Galenical preparations and isolated pure principles of digitalis are comparatively slowly absorbed when administered by mouth to normal individuals. In patients suffering from cardiac disease, a condition of acute circulatory embarrassment often occurs, rendering it of the greatest importance to secure prompt drug action; but the venous stasis dependent upon the circulatory failure gives rise to engorgement of the gastro-intestinal mucosa and consequently, further delays absorption by this route.

In the treatment of such patients, clinicians have long desired some remedy that could be introduced directly into the blood stream and bring about full and prompt action. The infusion of digitalis has been employed in this way, but it would seem that it would be desirable to study upon lower animals the effect of

introducing the number of undesirable constituents present in crude preparations of digitalis before the use of the infusion in this manner could be unqualifiedly endorsed. Then too, the experiments of Hatcher and Eggleston have shown that the commonly held opinion regarding the instability of the infusion is fully justified. Finally, it would be hard to secure an estimate of the strength of crude preparations of digitalis sufficiently accurate for use in standardizing remedies for intravenous use.

Credit is due to Hatcher for drawing attention to the possible value of Strophanthin gratus; known as crystalline Strophanthin, Thoms; or better, as Ouabain. This substance is a crystalline glucoside, isolated from Strophanthus gratus; probably a definite chemical compound; and is readily soluble in water or alcohol.

Amorphous strophanthin has been used quite extensively for intravenous administration; and the results have often been very favorable. The chief disadvantage in the use of this substance is the uncertainty concerning its composition, it being probable that it is a mixture of different glucosides and different lots are apt to vary in strength.

Ouabain in a dry condition kept under ordinary climatic conditions, exposed to air and light, undergoes no change in two years that can be detected by animal experiments. The convenience afforded by offering the physician a solution of Ouabain in ampoules, has led us to undertake a study of its keeping qualities when dissolved in solutions of different composition.

Ouabain was dissolved in distilled water, in normal salt (.09%) solution; in 5 percent alcohol; in 10 percent alcohol; in 25 percent alcohol and in 95 percent alcohol. The ouabain percentage was 1/10 to 1/100. Some of these solutions were tested upon frogs, using Cushny's one hour method; others upon guinea pigs, using a 24 hour lethal dose method; and a few upon cats, using Hatcher's method. The frog and cat methods have already been fully described elsewhere. The guinea pig method is a modification of Reed's. The dose is calculated per gram body weight and injected subcutaneously as in Reed's method. We have found it necessary, however, to take account of the alcoholic content of the solution and also advisable always to use the same volume of fluid per gram, so 0.01 cc. fluid per gram weight is always injected and 25 percent alcohol has been used in all the tests. It is also more satisfactory to observe the animal for 24 hours, because it is very common for pigs to survive more than three hours and succumb before the expiration of twenty-four hours. Occasionally, an animal succumbs only at the end of forty-eight hours, but this is unusual. Attention has already been called to the unreliability of the guinea pig method in attempting to standardize the members of the digitalis group, but in a comparative study such as this the factor of seasonal variation does not enter. The results may be tabulated as follows: "Drug strength means the strength of the original solution, which was reduced to 1:100000 for the cat assay; 1:20000 for the frog assay; and 1:10000 for the guinea pig assay whenever it was originally stronger. The figures under cat assay are fractions of a milligram per kilo; under guinea pig and frog assay are fractions of a gram per gram.

I. OUABAIN IN AMBER GLASS CONTAINERS.

Age of Solution	Solvent	Drug Strength	Container	Cat Assay	Guinea Pig Assay	Frog Assay
2 days	95% Alc.	1:1000	Flask	.0788	.00000025	.00000045
9 months	Water	1:10000	Amber Bottle	.....	.00000025	.00000045
14 months	Water	1:10000	Amber Bottle	.0800	.00000025	.00000046
28 months	Normal Salt	1:1000	Amber Bottle	.0796	.00000027	.00000046

From these results it may be assumed that Ouabain dissolved in distilled water or in normal salt solution and kept in amber bottles suffers no appreciable loss of strength in 28 months.

Two samples had been kept in glass-stoppered flint bottles and the assay of these give rather surprising results.

II. OUABAIN IN FLINT GLASS CONTAINERS.

Age of Solution	Solvent	Drug Strength	Container	Cat Assay	Guinea Pig Assay	Frog Assay
2 days	95% Alc.	1:1000	Flask	.0788	.00000025	.00000045
*22 months	Water	1:1000	Flint Bottle	.....	.00000036	.00000067
*32 months	Water	1:1000	Flint Bottle	.....	.00000055	.00000075
36 months	95% Alc.	1:1000	Flint Bottle	.....	.....	.00000052

*First and second assays on same sample.

From these tests, it seems that the nature of the container and the presence of alcohol influence the rate of deterioration. While an aqueous solution in an amber cork-stoppered bottle suffers little or no change in strength during twenty-eight months; an aqueous solution in a flint glass-stoppered bottle loses strength to a considerable degree in twenty-two months. Of course, too much weight should not be given the results obtained with such a limited number of samples.

Since the aqueous solutions of Ouabain in amber bottles show no loss in strength that could be detected in twenty-eight months, it seemed unnecessary at this time to test those containing alcohol, because other things being equal, an aqueous solution is preferable to an alcoholic solution for intramuscular or intravenous use. Frog assays with these solutions showed that those containing five percent and ten percent alcohol gave the same value at the end of fourteen months as did the aqueous solutions, the containers being amber bottles.

In conclusion it may be said that the results of our work indicate that aqueous solutions of Ouabain in amber glass containers are sufficiently stable to justify reliance being placed upon them by the physician.

DEPARTMENT OF EXPERIMENTAL MEDICINE, ELI LILLY & CO., Indianapolis, Ind.

THE MEDULLARY RAY CELLS IN RHAMNUS PURSHIANA AND IN RHAMNUS CALIFORNICA.

OLIVER A. FARWELL, DETROIT, MICH.

Ever since Cascara Sagrada, Rhamnus Purshiana, D. C., became a prominent therapeutic agent it has generally been conceded that it could be distinguished from its near ally, Rhamnus Californica, Esch. by the character of its medullary rays as seen in a cross section of the bark. Prof. Henry Kraemer, in a study of the bark of Rhamnus Purshiana, (Journal of the American Pharmaceutical Association, Vol. 1, page 846, August, 1912) makes the following statement: "It is usual to attempt to differentiate between the barks of Rhamnus Purshianus and Rhamnus Californicus by reason of the apparent difference in the number of cells comprising the width of the medullary rays." This has reference to the ray as seen in the cross section of the bark. It is possible that most authors, in the study of this work, have relied chiefly upon the number of cells in the width of the ray to distinguish it from R. Californica; but it is not the chief character. The two barks can readily be distinguished in cross section by comparing the rays without reference to the number of cells in their width, although those of R. Purshiana generally have fewer cells. The rays of R. Californica are fewer, probably not over one-half or two-thirds as many and, therefore, have much wider spaces between them; they are more curved and irregularly grouped, and as the ends are not even with the rest of the tissues, as they are in R. Purshiana, the cambium edge of the section presents a very pronouncedly wavy or lobed line, that of R. Purshiana being even. Prof. Kraemer also calls attention to the fact, which most investigators have either forgotten or overlooked, that the tangential-longitudinal section alone gives the general outline as to height and width of the medullary ray and lays great stress upon the importance of this section, which should be in the cambium region, in furnishing the distinguishing characters in the medullary ray, if such there be, between closely related species. Rhamnus Purshiana is illustrated showing the bark in all three sections, cross, radial-, and tangential-longitudinal; Rhamnus Californica is not illustrated as Prof. Kraemer did not have authentic material for investigation. Upon reading Prof. Kraemer's paper, I immediately took steps to obtain authentic bark of Rhamnus Californica for investigation. A supply was obtained in the fall of 1912 but as no fruit or leaves from the same shrub accompanied the bark, for its identification botanically, nothing was done with it. In the spring of the present year, the collector was again approached, and this time he furnished another supply of the bark, together with flowering branches from the same shrub that furnished the bark. This proved to be typical Rhamnus Californica and a comparison of the twig bark with that of the bark in bulk showed the two to be of the same species. In the cross sections of the barks the rays of both species, in the sections examined by me, were from one to four cells wide but in Rhamnus Purshiana those of one and two cells in width were quite frequent while they were rare in Rhamnus Californica. As to the character of the rays, themselves, which is more important than the number of cells, the dis-

tinctions as outlined above were seen to be well defined. In the tangential-longitudinal section I found the ray in Rhamnus Purshiana to be from one to five cells in width, commonly three or four; in Rhamnus Californica the ray in from one to seven cells wide, commonly four or five. In the former the cells are pretty evenly arranged in lines, and are of about the same size; while in the latter, when more than four cells wide, the cells are irregularly arranged in the center of the ray and of variable size.

Perhaps it will not be amiss before dismissing the subject to make a few remarks upon the cultivation of Rhamnus Purshiana in Michigan. The plant, according to the *Kew Bulletin*, has been, for several years, cultivated with success in Ireland. In 1907, at my request, Messrs. Parke, Davis & Co. procured about eighty seedlings of Rhamnus Purshiana from Oregon. These were transplanted in October of that year on the lawn in front of the laboratory. The trees are not protected with winter buds so it was a question as to whether or not they would withstand the rigor of our climate. In order to make a thorough test they were planted near the Detroit river and ran inland or in a line at right angles with the river bank. Most of them would be directly exposed to the freezing winds from the icy river while a few would be more or less protected by near-by buildings. The first winter the transplanted seedlings were well protected by wrappings of straw and sacks while the ground was covered with plenty of straw; in the following winters they were not protected. During the six years since they were planted about eighty-five percent have died or all that were not protected from the cold winds from the river. The more vigorous trees are about 12 feet in height and 4 inches in diameter at the ground. They have blossomed this year for the first time but no fruit has developed. The plants were planted in made ground consisting mostly of blue clay and some greyish clayey loam. The inference is that Rhamnus Purshiana can be successfully cultivated in Michigan in situations where it can be protected from the direct blasts of the cold icy winds.

BOTANICAL LABORATORY OF PARKE, DAVIS & CO., Detroit, Mich.

NOTE ON THE ACIDITY OF HYDROGEN PEROXIDE SOLUTION.

B. L. MURRAY, PH. C., RAHWAY, N. J.

The acidity of solutions of hydrogen peroxide may be due to one or more acids, free phosphoric, sulphuric, or hydrochloric acid usually being present. To determine quantitatively how much free acid is present has been studied by many, and with varying success. The choice of an indicator for the titration must be made, and it has generally been attempted to select one indicator suitable for all cases. Of course the amount of free acid in solution of hydrogen peroxide for general medicinal use does not need to be controlled very closely, so perhaps one indicator for all acids is sufficient. But by following out a suggestion published

by the writer some years ago, and lately elaborated, we can easily select an indicator suitable to the acid to be titrated.

It was advised that one could decompose the hydrogen peroxide by means of platinum metal, subsequently titrating the acid remaining. This procedure has now assumed this shape. Place the customary 25 cc. sample of peroxide and an excess of decinormal solution of sodium hydroxide in a long test tube (about 8 or 10 inches long). Add about three grams of platinized pumice stone and place the tube in a steam bath for about 15 minutes, or until the peroxide is all decomposed. The heat and the shape of the container (long and narrow) hasten the reaction. It only remains to pour the remaining liquid into a beaker or flask and complete the titration of the acid that was in the peroxide, now in simple aqueous solution as a sodium salt. In our hands an excess of standardized acid is generally added, followed by boiling and subsequent titration with decinormal alkali. Any indicator suitable to the acid and conditions at hand can be used. Experiments show that it is easy by the above method to so completely destroy the peroxide that no reduction of permanganate can be obtained from the resulting liquid. The pumice stone is easily prepared by soaking the stone in solution of platinic chloride, then igniting, then re-soaking and re-igniting. It is used over and over.

THE EDUCATION OF THE PUBLIC.

The education of the public in matters pharmaceutical is being attempted in various states, with the object of putting the druggist right in the eyes of the public. During the past decade certain lay newspapers have carried on campaigns against the proprietary medicine business, with the admitted object of destroying it. Recently there appeared in the "Ladies' Home Journal" an article entitled "The Meanest Business in the World—Cheating the Sick," wherein remedies for women's ailments, soothing-syrups, and headache and cough preparations were condemned as a class. Unfortunately, the writer made his attack too inclusive, stating that such medicines (excluding the first named) "all depend for their effect upon alcohol, and one or all of the stupefying drugs—opium, morphine, or chloroform." The writer went on to say that "used to excess they kill outright; used even in moderation, they gradually become a necessity to the child's system, and before the parents realize the danger they have on their hands a victim of the drug habit." Such misstatements are freely copied by the newspapers throughout the country, with the result that an unmerited slur is cast upon the drug business. In order to combat this influence, the Wisconsin State Pharmaceutical Association has formed a publicity bureau, charged with the duty of disseminating among the country papers short articles that will set the druggist right in the public eye. The time has come when the public must be told that the maker of ready-made medicine is not necessarily a faker and a charlatan.—American Letter in *The Chemist and Druggist* (London).

Section on Pharmacopoeias and Formularies

Papers Presented at the Sixty-First Annual Convention

PHARMACOPŒIAL TITLES FOR NEW REMEDIES.

M. I. WILBERT, WASHINGTON, D. C.

A review of the now existing national pharmacopœias suggests the thought that from the point of view of nomenclature the several books may be classified as following either the English, French, Scandinavian or German system and that apart from adhering more or less closely to the general style that has been in the prototype, little or no attempt has as yet been made to secure any degree of international uniformity in the accepted title for official articles.

The greatest amount of variation is of course to be found in connection with the official names for chemical substances, and using these names as the basis for the classification, we find that broadly speaking, the English style is followed only in the British Pharmacopœia and in the Pharmacopœia of the United States. The French system gives precedence to the vernacular title and uses the Latin only as a secondary title, usually for chemical substances and galencial preparations that are prescribed by physicians. Vernacular titles occur in the French, Spanish and Italian Pharmacopœias. The Scandinavian style, which it may be here pointed out, is based on an understanding between representatives of the Scandinavian countries, still adheres closely to the Berzelian system of nomenclature, giving precedence to the acidic radical in salts. This system is followed rather closely in the Swedish, Norwegian, Danish and Dutch Pharmacopœias, in the Latin titles of the Spanish and Italian Pharmacopœias and in the Latin synonyms of the Belgian Pharmacopœia. The German system so well known to us through the German Pharmacopœia is also included in the Swiss, Russian, Belgian, Austrian, Hungarian, Servian and Japanese Pharmacopœias, in the Latin titles of the French Pharmacopœia and the synonyms of the Danish Pharmacopœia.

The possible mistaking of the name for a comparatively innocuous substance for that of a much more active one has been repeatedly cited as an argument for greater uniformity. In this connection it will suffice to call attention to the Continental "chloratum," which in English speaking countries has not infrequently been mistaken for chlorate in place of chloride.

The exceptional titles for widely used chemical substances occur almost exclusively in the American and the British Pharmacopœias, which have uniformly adopted potassium and sodium for the universally used kalium and natrium despite the fact that kalium and natrium are thoroughly well established as designations for the elements themselves in connection with the symbols for atomic

weights. A somewhat similar exception occurs in the Russian Pharmacopœia where "magnium" is used in place of magnesium.

The obstacles in the way of international uniformity in pharmacopœial nomenclature are not so many and so varied as one would expect from the truly provincial system of pharmacopœial revision that has generally prevailed up to recent years. With a modernization of the pharmacopœias still adhering to the Berzelian system of nomenclature and sundry slight changes on the part of the Pharmacopœias of the United States and of Great Britain, the nomenclature of chemical substances, of pharmacopœial preparations and of practically all drugs could be readily made uniform and even at the present time this uniformity could be obtained for all practical purposes if the revisers of these several pharmacopœias would adopt the precedent established by the Committee of Revision of the Danish Pharmacopœia and include the most widely used official titles as synonyms.

A rather more difficult problem is, however, presented by the official recognition of some of the newer chemical remedies, particularly those of foreign manufacture which have been given short and catchy titles by the manufacturers. These titles, in some countries, at least, are accepted as property and protected by law, while in other countries, our own for example, where the law does not provide for such protection, the general adoption of the names has been prevented by fear of legal difficulties.

Some idea of the complications existing at the present time may be gathered from the following enumeration of the titles under which three widely used articles have been included in foreign pharmacopœias:

Theobromine Sodium Salicylate—
Theobrominum Natrio-salicylicum, Austr., Belg., Japan.
Theobromino-Natrium salicylicum, Germ., Helv.
Salicylas natrico-theobromicus, Dan.
Salicylas natricum cum Theobromino-Natrio, Ndl.
Salicylas sodæ et theobrominæ, Hisp.
Theobromino-salicylas natricus, Svec.
Diuretin (as a synonym), Austr., Belg., Dan., Svec., Ital., Hisp.

Epinephrine—
Adrenalinum, Fr., Helv., Ital., Belg.
Suprarenin hydrochloricum, Germ.
Suprareninum, Ndl. (Suppl.)

Aspirin—
Acidum acetylosalicylicum, Helv., Germ.
Acidum acetylo-salicylicum, Dan.
Acidum Acetylsalicylicum, Fr.
Acidum acetsalicylicum, Japan.
Aspirin, As a synonym in Germ.

In the U. S. P. VIII an attempt was made to include some of the newer remedies under abbreviated titles. The following list gives the titles under which several of these articles have been included in our own and in foreign pharma-

copœias and it is rather interesting to note that with the single exception of acetphenetidin, not any of the abbreviated names have as yet found favor with other pharmacopœial revisers:

Acetphenetidinum—

Phenacetinum, Germ., Brit., Ndl., Japan., Belg., Dan., Helv., Svec., Hung., Fr., Russ., and as a synonym in Austr., Serb.

Fenacetina, Hisp., Ital.

Acetphenetidinum, Austr., Serb.

Hexamethylenamina—

Hexamethylentetraminum, Germ., Ndl., Japan., Dan., Helv., Svec., Ital.

Utropin (as a synonym), Germ., Ndl., Dan., Ital.

Sulphonethylmethanum—

Trionalum, Austr., Svec., Fr., Ital., Hung., and as a synonym in Ndl. and Belg.

Methylsulfonalum, Germ., Ndl., Belg.

Methyl Sulfonalum, Japan.

Sulphonmethanum—

Sulfonalum, Germ., Hisp., Ndl., Japan., Belg., Austr., Dan., Helv., Svec.,Fr., Serb., Ital., Hung., Russ.

Sulphonal, Brit.

A rather significant indication of the lack of popularity that has been developed by these abbreviated titles is suggested by a review of the Index Medicus for the years 1905-1912, inclusive. This publication, as is well known, reflects in a rather comprehensive way the medical literature of the world and a careful search through the index of the publication fails to show a single occurrence of the words acetphenetidin, sulphonethylmethane and sulphonmethane, despite the fact that phenacetin, trional and sulphonal occur repeatedly. Urotropin and some of the other proprietary names for hexamethylenetetramine also occur in all of the several volumes, though hexamethylene does not occur at all in the volumes previous to 1908. In the latter year, owing no doubt to the inclusion of the drug as hexamethylenetetramine in a number of European pharmacopœias, the name occurs in connection with the title for one paper and re-occurs in several succeeding years, but very sparingly.

The ointment bases of the Pharmacopœia appear to offer rather a difficult problem from the American point of view, largely perhaps because of the fact that succeeding committees of revision have been unwilling to undertake a possible legal controversy in regard to proprietorship in name. Designed as our laws are to protect the interests of the many against the usurpations of the few, it would appear to be a comparatively simple procedure to have the legal rights of the people at large adequately defined either by statute or by court decisions Trade-mark registration in this country involves no recognition of property right and is at best but a record of claim to ownership. The present law obviously restricts the right of ownership in a trade-mark to a designation of the brand of a particular product made by a manufacturer and this mark or designation must be apart from the title under which the article is known or sold. The following names for widely used ointment bases illustrate the difficulties that have

been encountered with the problems abroad and also suggest the desirability of proper inquiry as to the validity of existing trade-marks in this country.

Adeps Lanæ Hydrosus—

Adeps lanæ cum aqua—Germ. IV, Ndl., Japan., Dan., Russ., Fr., and as a synonym in Belg., Helv.

Lanolinum—Helv., Svec., Germ. V, Ital., and as a synonym in Ndl., Austr., and Dan.

Adeps lanæ hydrosus—Brit., Austr., Serb., Hung.

Lanolinum cum aqua—Belg.

Petrolatum—

Vaselinum—Japan., Belg., Austr., Dan., Helv., Svec., Fr., Serv., Ital., Russ.

Vaselinum flavum p., Germ. V, Ndl., Hung.

Paraffinum molle—Brit.

Vaselina—Hisp.

The U. S. P. title "Adeps Lanæ Hydrosus" has never come into general use and as a court decision (Hyg. Lab. Bull. No. 87, p. 205) has long since established the fact that the name lanolin became a free title when the patent on the product expired there appears to be no reason why anhydrous lanolin and lanolin should not be used in place of wool fat and hydrated wool fat in the Pharmacopœia of the United States.

The word "Vaselin" is so widely used as a popular title for a semi-solid fatty substance obtained from petroleum, and in European countries particularly has been so uniformly accepted as the official name for the product included in our own Pharmacopœia as petrolatum that there is considerable reason for the use of the word "vaselin" regardless of the claim that it is or was used as a trademark for the product of any one firm.

The U. S. P. title for one of the comparatively new remedies, "Solution of Hydrogen Dioxide," has been severely criticized, by chemists particularly, who point out that dioxide is used to designate certain definite combinations like manganese dioxide and is not applicable to a peroxide such as exists in the official solution. There appears to be no well founded reason why our official title should not comply with foreign pharmacopœias, and it might well be made to read "Solution of Hydrogen Peroxide."

As noted above, the problems involved in the securing of international uniformity in pharmacopœial titles while at times complicated, are by no means insurmountable and could be readily overcome if the revisers of the several pharmacopœias made sincere and consistent efforts to do so.

DISCUSSION.

W. C. Alpers, of New York, said Mr. Wilbert had expressed the wish in his paper to avoid the mistake made in foreign pharmacopœias of including the synonyms of an entire nation in the pharmacopœia. There was a tendency among some people to expect everything of the pharmacopœia. They thought the pharmacopœia was a pharmaceutical cyclopedia. He had always opposed this idea. He did not believe a pharmacopœia should be anything else than a book of standards for the drugs and chemicals used in the country for which it was intended. The question of bringing harmony out of the chaos of different nomenclatures rested with the International Pharmaceutical Congress, and one of the objects of that Congress was to find a way of uniformity in this matter, but it would probably be many years

before this desired end was accomplished. He had no doubt the same desire existed in other countries as in this, of bringing about greater uniformity. But, in the very nature of things, care must be exercised in a matter of this kind, and progress would necessarily be slow. No committee that could be appointed could successfully deal with a subject of such broad scope, and the only thing that could be done was to make recommendations to the International Congress as to this particular phase of their work; but not until the pharmacists of the world were gotten near enough together, by a conference, on scientific matters, would a remedy be found.

Mr. Wilbert responded that the pharmacists of America were extremely slow to adopt the recommendations of the International Congress. The Brussels Conference had suggested, not one name, but several for each article, and in a number of instances none of these had been adopted in this country. The International Conference could only suggest or recommend, and true uniformity could be had only when the necessity of such a thing became apparent everywhere. The trouble with the pharmacists of America was, that they were so provincial they were not willing to adopt the recommendations made by the International Congress, and put in the form of an international treaty signed by diplomatic representatives. This was one serious fault of the pharmacists of this country, they were over-conservative in making headway in such directions as this.

James M. Good, of St. Louis, thought it could be only pure selfishness that would deny the privilege of using the name "phenacetin." What one of the speakers had said did not apply with the same force to phenacetin that it did to diuretin, for instance. In many drug stores, it was not known that acetphenetidin was the official name for what was the proprietary product "phenacetin." He thought there was no necessity for the two names. Out in St. Louis, he said, a man could say, "I want to be called 'George Washington'," and the courts would allow him to adopt the name; but it was a different proposition when it came to the United States courts. "Why, are we afraid of these people," he asked, "and hence not willing to give these synonyms?" He understood from what Mr. Raubenheimer had said that the probabilities were, that these people did not want any legal facts to be in the hands of the pharmacists of the country.

Mr. Wilbert, commenting upon this last suggestion, as to the legal phase of this matter, said that the American Medical Association, which was a responsible financial institution, had said that these names were applicable to the pharmacopœial articles. These facts had been published in the Journal of the American Medical Association repeatedly, and if these people had desired to do any fighting they had had ample opportunity.

Mr. Good suggested that it might be put up to the Pharmacopœial Committee as to whether or not these synonyms could be used. This was a subject that all pharmacists were vitally interested in, and he thought this Committee of Fifty could deal with it. Very few pharmacists were capable of acting intelligently on a proposition of this kind, but the committee should be able to give a good reason for whatever it did.

TABELLÆ DULCES, SWEET TABLETS FOR CHILDREN'S MEDICATION.

BERNARD FANTUS, M. D., PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS, COLLEGE OF MEDICINE OF THE UNIVERSITY OF ILLINOIS, CHICAGO.

Modern pharmacy boasts of many elegant and palatable preparations suitable for adults. But very little has thus far been done in this line for children, and yet attractiveness and palatability are even more important for the little ones than for the grown-up. Syrups have hitherto been our chief aids in making medicines more acceptable to children. Unfortunately, many a child has had its palate

offended by liquid medicine so that it abhors spoon-medicine of any kind, and will struggle even against the most palatable. It is especially for such children—and there are a great many of these—that another method of administration is needed. As all children love candy, this form would seem to be most desirable for children.

In name and in principle, "candy medication" is even now recognized by the Pharmacopœia. Have we not confections and troches? Unfortunately, the pharmacopœial conception of a confection does not coincide with the confectioner's. Have you ever seen Confection of Rose sold in a candy store? If it were a really delicious confection would not the confectioner be glad to take it up? Confection of Senna is far from being delicious. I know whereof I speak. In the early days of my experiments on "candy medication," I tried to put Confection of Senna into attractive dosage forms with the hope of making the youngsters think it was candy; but without the least success. Troches have been defined as "confections made into various dosage forms and dried." How many troches are real candy? How many of them are popular? Of course, I recognize that the chief purpose of troches is throat medication and not palatability; that they are intended to dissolve slowly in the mouth, so as to give prolonged contact of the medicament with the throat. Real "candy medication" is therefore not yet to be found in the Pharmacopœia.

The sweet tablets to which I desire to call your attention are—to use a phrase of the drug-store vernacular—"just as good as" candy; and they are the only candy form I know of that can be prepared extemporaneously by the pharmacist. These tablets, to be successful, must be perfectly pleasant, actually delicious sweets, free from any suggestion of medicinal taste or odor, as the ailing child is liable to be very critical. The tablet should disintegrate readily in the mouth, for a sick child usually will not chew or suck candy as a healthy one would.

Having conducted a study to determine to what extent the materia medica would lend itself to this form of medication, I was surprised to find that the list was quite extensive. Within the last few weeks I have been able to enlarge this list still further, thanks to the discovery by John Uri Lloyd, of almost tasteless compounds of the alkaloids, called by him Alcresta Alkaloids, which are obtained by precipitating alkaloidal salts with a reagent that, I am told, is essentially composed of hydrous aluminum silicate which combines with alkaloids possibly by reason of adsorption. These precipitates are insoluble in neutral and in acid liquids but soluble in alkaline fluids; hence may be expected to unfold their activity in the intestine. The slight alkalinity of the saliva does not liberate enough of the alkaloid to bring out the bitterness excepting in case of the strychnine and of the quinine compounds. These Lloyd has subdued practically to tastelessness by combining the strychnine with free tartaric acid, and in case of quinine by combining it with glycyrrhiza and a tannin. The first question that comes to one's mind is, whether by removing the taste, the activity is not likewise annulled. That this is not the case can be positively asserted in regard to strychnine, the Alcresta compound of which will kill a dog quite as readily as strychnine sulphate. It may be inferred that the other preparations will likewise not be impaired in their activity; though this remains to be demonstrated. By the use of these compounds, the alkaloids become available for administration

in candy form. Strychnine can be given to the extent of 1/200 grain per 5 grain chocolate tablet. The Alcresta compounds of morphine, of codeine, of cocaine, and of atropine, permit the administration of adult doses in five grain sweet tablets. I have also experimented with Alcresta compounds of cinchonine, cinchonidine, berberine, sanguinarine, gelsemium alkaloids; and have found all of them more or less suitable for this method of administration. It is evident therefore that sweet tablets are a form of pleasant administration of such wide applicability that it would rarely be necessary to inflict upon children less pleasant medicine.

I have found three fundamentally different formulæ of use: 1, Sugar tablets; 2, Chocolate tablets; 3, Licorice tablets.

1. *Sugar Tablets.*—There are quite a number of medicines sufficiently free from taste to be made pleasant by the mere admixture of sugar and of flavoring. The addition of a little of harmless coloring seems desirable, as pleasing color adds considerably to the attractiveness of the tablet for the little ones. The powder, after having been moistened with alcohol, may be moulded in a tablet triturate mould. Or else, it may be made into compressed tablets by the use of an inexpensive tablet machine. The addition to the powder of 3 percent of cacao butter or of paraffin causes it to retain the shape imparted to it by the machine; the paraffin being preferable if the tablet is to be kept for some time; cacao butter, if it is for immediate consumption. If the powder has a tendency to stick to the dies, the further addition of 3 percent talcum is advantageous. If a considerable amount of insoluble powder enters into the composition of the tablet, the addition of talcum is unnecessary. The following might be taken as a typical formula for sugar tablet:

TABELLAE TERPINI HYDRATIS DULCES, GR. ½.

SWEET TABLETS OF TERPIN HYDRATE.

Terpin hydrate	50 grains
Paraffin, low melting point, in thin shavings	15 grains
Tincture of curcuma	60 minims
Spirit of rose, 10%	5 minims
Powdered sugar	435 grains

Mix the terpin hydrate with the sugar, the coloring and the flavoring by thorough trituration in a mortar, incorporate the paraffin by gentle trituration; and compress in tablet machine, using three-eighths-inch die and punches, to make 100 five-grain tablets.

It might be remarked in passing that these tablets of terpin hydrate, as well as quite a number of others, are not only suitable for children's medication, but for adults as well. Two of these tablets would be equivalent to a teaspoonful of the N. F. Elixir of Terpin Hydrate in a much more pleasant form.

2. *Chocolate Tablets.*—Substances that have a slightly bitter or otherwise slightly disagreeable taste can well be disguised by the addition of 10 to 20 percent of powdered cacao to the sugar. The addition of a small amount of Tincture of Vanilla, say 3 percent, is of advantage to improve the flavor of the cacao. So nicely does the cacao-containing powder lend itself to compression in a tablet machine, that the formula for the chocolate tablet might be considered the formula

of choice, if one general formula for sweet tablets were desired. The following might serve as a typical example:

TABELLAE ACETPHENETIDINI DULCES, GR. ½.

SWEET TABLETS OF ACETPHENETIDIN.

Acetphenetidin	50 grains
Powdered cacao	100 grains
Tincture of vanilla	15 minims
Powdered sugar	350 grains

Mix the ingredients by thorough trituration in a mortar; and compress in tablet machine, using three-eighths-inch die and punches, to make 100 five-grain tablets.

The taste of tablets containing some of the ordinary salts of alkaloids can be improved by the addition of a small amount (1%) of sodium bicarbonate; some need a little saccharin in addition. To the Alcresta alkaloids, on the other hand, alkali must not be added, as that would bring out the bitterness.

3. *Licorice Tablets.*—There are a few substances that are better disguised by extract of glycyrrhiza than by cacao. A formula for such a tablet would be:

TABELLAE ANTIPYRINAE DULCES, GR. ½.

SWEET TABLETS OF ANTIPYRIN.

Antipyrin	50 grains
Extract of glycyrrhiza, powdered	25 grains
Caramel, 50% solution	30 minims
Spirit of anise, 10%	8 minims
Spirit of coriander, 10%	4 minims
Powdered sugar	425 grains

Mix the ingredients by through trituration in a mortar; and compress in tablet machine, using three-eighths-inch die and punches, to make 100 five-grain tablets.

These sweet tablets are so delightful in practice among children, that any one who has used them once would never again wish to do without them. Why should iron ever be given to a child in other form than that of some delicious sweet tablets of iron carbonate? Why should a little one suffering from cardiac weakness and in need of a heart tonic be permitted to struggle against medicine, and thereby jeopardize its life, when digitalin, strophanthin and even strychnine can be given in candy form? And quinine can be given in positively pleasant form as sweet tablets of aristochin, of saloquinine, or of Alcresta quinine.

If these sweet tablets are useful in medical practice—and it can readily be proved that some of them are—why should not one of our formularies, the Pharmacopœia or the National Formulary, help in introducing them? Why should not the pharmacists of the country be given the opportunity of preparing these tablets? There is no doubt in my mind that any pharmacist who will equip himself with the necessary apparatus, costing not much more than $10, and who will busy himself to get the physicians of his district acquainted with these new preparations, would reap a rich harvest. Should pharmacists equip themselves to prepare these tablets extemporaneously so that physicians could prescribe them, the patient would receive a fresh product fitted exactly to his needs, for

the dose could be modified and several medicaments combined in the same tablet, as occasion may require.

My conclusions are:

1. There are a considerable number of drugs that can be administered in form of perfectly sweet tablets, particularly desirable for children's medication.

2. These sweet tablets can be readily prepared extemporaneously by any pharmacist equipped with an inexpensive apparatus.

3. A few sweet tablets, such as those of calomel and of phenolphthalein are now in extensive use.

4. These and a few others of undoubted desirability should be introduced into the Pharmacopœia or the National Formulary.

5. If this be done, a definite advance in pharmacy would be recorded, suffering childhood would many times be spared the hardship of having nasty medicine forced upon it, and grateful mothers and nurses would bless the day of the new medication.

DISCUSSION.

Mr. Wm. C. Alpers, calling attention to the use of the three colors, green, red and white, obtained by solutions of malachite green and carmine, and tincture of curcuma, respectively, suggested that green might more appropriately be applied to tablets that should be classified as poisons,—to drugs like arsenic, and antimony-potassium tartrate,—and expressed the opinion that some system should be observed in the coloring scheme. Comparing the two formulas for terpin hydrate and terpin hydrate with heroin, he pointed out the difference between the two, in that, with the latter, chocolate powder was used as the coloring-matter, whereas with the first-named tincture of curcuma was used. Again, as to flavors, the one was flavored with vanilla, while the other was flavored with spirit of rose. If any system was employed, he desired to be enlightened upon that point. He suggested that one would naturally think, as to these two formulas, that they would be in the same system. He thought it might be a question as to whether sugar should be used in all cases for children; but this was not a question for the pharmacist, but for the physician himself to answer.

Doctor Fantus said he appreciated the remarks of Doctor Alpers, and that there was a certain amount of system observed in the coloring scheme he had used. He had tried to use green or deep red for poisonous substances. For instance, there was elaterin, a substance that might be considered rather active. He had used as deep a red for that as he thought desirable. Then, there was hyoscine, which was colored a rather deep red. And again, green was used for some poisonous tablets. He confessed that he had not carried out this idea as consistently as might be desirable. He had found green was attractive to children, and he had also used it for other tablets, that were not poisonous for instance with acetylamidosalol. The idea advanced of marking poisons by a particular color seemed to him to be a good one, and it would be carried out more definitely in future work.

The difference in color between terpin hydrate tablets and those of terpin hydrate with heroin, was due to the bitterness of the heroin, which was best disguised by chocolate. He called attention to the fact that the heroin tablets were also chocolate tablets.

As to the question whether sugar might not be, at times, objectionable in the treatment of sick children, he confessed that it had also given him considerable concern. However, the conditions in which the small amount of sugar given with the medicaments in this form would be objectionable must be very rare indeed.

These tablets were not intended for babies. They were intended for children, from the ages of three years to nine; and the doses were calculated for a child of three, although some of them could be given in larger doses. Children of that size he did not believe would be harmed by the amount of sugar given them in connection with the remedy. Anyhow, actual experience with many of these had shown that was not the case.

This work was merely experimental, and more to show how many different medicaments

could be put up in this form. Some of them would probably be useless. Experience would show how many could be successfully used. He had found his own practice to increase to a marked degree since he had been using this form of medication.

Dr. Fantus concluded by saying that he had brought this subject before this body of representative pharmacists of the country for the reason that he wished their coöperation in keeping this form of medication in the hands of legitimate pharmaceutic practice, instead of having it forced upon the market as a new line of proprietary medicines.

W. R. White, of Nashville, said he was particularly interested and pleased with this paper. It bore on a subject that he had given some attention to heretofore, in a paper that he had read before the Los Angeles meeting, in which the subject of chocolate and its uses in pharmacy were considered. In that paper he had referred to the use of chocolate in disguising the taste of a great many different medicines. One question that presented itself to his mind and which was not brought out here was the fact that some people did not swallow tablets, and in such cases a powder was necessary to be administered. In these cases he thought a powder consisting of chocolate and sugar might be prepared and used in many instances, instead of the aromatic and other powders used. The value of chocolate was being more and more recognized, continually. A good many pharmaceutical houses were using it in preparations that were elegant, and they had become very popular.

J. L. Lascoff, of New York, called attention to the fact that Doctor Fantus had said that there were certain manufacturers putting on the market strychnine and other poisonous substances in tablet form, and stated that several cases of poisoning had occurred with children, where they had mistaken these tablets for candy. He thought all poison tablets should be of a certain color, for distinction. For instance, terpin hydrate tablets should be of a distinctive color. He said he had found a tablet machine costing $30.00 to give good results.

F. E. Stewart, of Philadelphia, said that he was very much interested in this subject when Doctor Fantus presented it to the meeting of the American Medical Association. He feared, however, that if the idea was logically carried out it would ruin the pharmaceutical business. He thought pharmacists were doing all they could to put themselves out of business by encouraging such things as this, and expressed the opinion that, if this kind of medication became very popular, it would be a question as to whether the pharmacist would have anything to do.

W. C. Alpers, speaking again on this subject, thought that if these tablets should become popular there was no doubt but that the manufacturing houses would make them; that they would not be made in the store of the pharmacist, but every manufacturer would take advantage of the opportunity, and offer them for sale. He thought it would be manifestly desirable in such case that tablets of the same kind should be turned out of the same color by the different houses, and right at the beginning the inventor should lay down certain rules as to the coloring. He could foresee that the failure to do this would lead to all sorts of trouble. The patient buying a tablet of a certain kind and color at one store would immediately raise objection if he was offered the same thing at another store in a different color. He thought that this question should be well-considered and determined by creating right at the start a well-defined system as to color. He was decidedly of the opinion that one distinctive color should be adopted for poisons; the rest could then be arranged in other ways. This would not apply to those articles where chocolate was used for the outside coating, but the rest should have a definite color-scheme. By following out this idea, a great deal of confusion, which would inevitably arise otherwise, would be avoided.

Continuing, Mr. Alpers called attention to the fact that a chocolate quinine tablet was being sold on the market, and suggested that a quinine tannate was formed from the tannin in the chocolate, which, being insoluble, had no taste. He said a great many physicians would not allow their patients to use these quinine chocolate tablets because of this insolubility, which they regarded as making them worthless. According to them, the presence of chocolate in the quinine tablets would make them objectionable.

Otto Raubenheimer, of Brooklyn, said that all knew how hard it was to administer medicine to children. Doctor Fantus had certainly taken a step in the right direction, in originating a scheme of preparing tablets which was intended for the pharmacist, and not for the

manufacturer. Of course, if the pharmacist remained ignorant and lazy, and did not prepare these tablets, the manufacturer would do it. These tablets could be made by the pharmacist by an inexpensive machine, and he had something here that he could make some money out of.

He did not agree that there was tannin in chocolate. The quinine chocolate tablets were prepared with quinine tannate. He thanked Doctor Fantus for originating these tablets, and expressed the hope that some standard work like the Pharmacopœia or the National Formulary would take up some of these formulas.

Doctor Fantus thanked the members very heartily for the interest taken in this work, and for the ideas brought forward. He regretted that he was not familiar with the paper referred to by Mr. White, in regard to the use of chocolate in disguising the taste of medicine, as he should have given him credit if he had known of it. It should be understood that these tablets should always be dissolved in the mouth; they were not intended to be swallowed whole. He saw no reasons for tablet-making, excepting for the purpose of either hypodermic administration or to be dissolved in the mouth. A pill could be swallowed much more readily than a tablet. A tablet was made in imitation of candy, and that was the reason it was attractive to children. He had found that powders were of no advantage, because children rebelled against them.

He admitted that the possibility of poisoning was probably the most serious objection to candy medication. There was undoubtedly danger that a child might get hold of a quantity of such poisonous tablets and eat them. However, that danger could be readily overcome by not prescribing, and not permitting to come into the house, any more than could be safely taken at one dose. Thus, if the physician prescribed only a few morphine tablets, and the little patient got hold of them and ate them all, no harm would be done. And the same with aconitine, and so on.

Referring to Mr. Alpers' suggestion that he should systematize a color-scheme for these tablets, Dr. Fantus agreed that this was an excellent idea, and he would profit by it.

A tablet machine, that would satisfactorily turn out prescription quantities of tablets, could be obtained from Whitall, Tatum & Co. at about $10.00. Doctor Fantus could see no reason why pharmacists should not take up tablet making.

F. W. Nitardy, of Denver, said that, some years ago, he had experimented with putting up castor oil in the form of candy, and had met with fair success. He had not done much with it of late, however. He put up the castor oil in the form of chocolate creams, each containing a teaspoonful of castor oil; and they were sufficiently disguised to deceive the clerks in the store to whom he handed around these creams; at least, none of them found out it was castor oil or that the candy was medicated, until they had been told. The process consisted of making an emulsion of castor oil, with condensed milk, sugar and flavoring, so that the finished product was of proper consistence and contained 50% castor oil. This was divided into lumps of about ¼ oz. each, which were then dipped in chocolate.

Doctor Fantus said he had worked with chocolate creams himself, but his experiments with cod liver oil in this form had been a failure—although in his early studies in this form of medication he had taken the pains to go to a candymaker for instruction, that he might find out what forms of candy would be most suitable for various forms of medication. He was not the first, however, to use chocolate cream in medication. Sir James Sawyer had published a process in *The Lancet* in 1911 for making medicinal chocolate creams, for which he had proposed the name "Cremulæ."

In response to a question by Mr. Lascoff, Doctor Fantus said that any process that required drying was practically excluded from extemporaneous pharmacy, for this reason, lozenges were excluded. The granulation ordinarily prepared for tablet making also required drying. A. Schleimer suggested, in 1909, the use of cacao tablet making. Three percent of cacao butter would do, but some tablets made with it would not keep well. He had endeavored to find some substance to substitute for cacao butter, and found that paraffin did just as well, using the same percentage. There might be some objection to paraffin, as it was insoluble and indigestible. He thought cacao butter should be preferred for tablets that are not to be kept for any length of time.

Section on Education and Legislation

Papers Presented at the Sixty-First Annual Convention

SOME ASPECTS OF OUR POISON LAWS.

B. L. MURRAY AND A. W. FRAME.

If there is any one here that handles poisons in a commercial way he can doubtless anticipate parts of this paper. For any one that handles poisons must label them and to label them properly is a difficult task. It is not such a troublesome task where the business is confined to one single state, but the uncertainties increase when an interstate business is attempted. In one single state there is generally the state poison law to be complied with, and, in addition, sometimes the city ordinances of some of the larger cities; while in interstate business there are forty or fifty poison laws to be taken into consideration. And yet without undertaking an *exhaustive* criticism of present poison laws, we are here to-day advocating the enactment of still another poison law; a law especially applicable to the interstate traffic in poisons.

The real difficulty in labeling poisons is not exactly in the *wording* of the label. It is easy, as a rule, to decide upon the wording of poison labels, selecting the color of the ink, the proper antidote, etc. The serious part of the work comes in deciding what articles are poisons and what are not. On this feature (deciding what articles are poisons) there seems to be no uniformity of opinion Wide variations in the individual state laws occur at this point, and one is finally brought to the homely question: What *is* a poison? The answer to this question is, or at least seems to be: We do not know. Just here is where the trade comes into difficulties. The trade as a whole wants to comply with the laws, but can find nothing substantial in the way of a poison law upon which to stand.

But surely in order to properly classify our various drugs and preparations as poisons or non-poisons, and then to label them, we must inquire as to the meaning of the *word* "poison." In these days of multi-legislation it becomes essential at once to inquire what the statutes say a poison is. Some definitions or statements that might be interpreted as definitions from state laws follow:

"Any substance which in doses of 5 grains or less is destructive of human life." (New Jersey.)

"Any poisonous medicine fatal to human life in doses of 15 grains or less." (S. D.)

"Any drug, chemical, medicine, or preparation liable to be destructive to adult human life in quantities of 60 grains or less." (N. Y.)

"Any drug, chemical or preparation which, according to standard works on

medicine or materia medica, is liable to be destructive to adult human life in quantities of 60 grains or less." (Kentucky.)

"Any drug, chemical, or preparation which according to the Pharmacopœia and Formulary and Homeopathic Pharmacopœia is destructive to adult human life in quantities of 60 grains or less." (N. Y.)

"All vegetable poisonous drugs and their pharmaceutical preparations and alkaloids." (N. M.)

"Article of a nature poisonous to the human system or to animals." (Louisiana.)

"Any chemical, drug, or medicine which is poisonous or which contains a poison." (Indiana.)

"Any article belonging to the class of medicines usually denominated poisons." (Miss.)

"Any article or articles of medicines belonging to the class usually known as poisons." (Neb.)

"Drugs commonly known as deadly poisons." (Porto Rico.)

"Any dangerously poisonous drug." (Utah.)

"Any deadly poison." (Hawaii.)

Much vagueness and indefiniteness is seen in making a comparison of the above definitions. But note, too, the deplorable lack of uniformity. Upon which of these definitions can one rest and feel sure that he is right, or even reasonably sure? How can any one comply with them? At first thought it would seem that poison in one state would be poison in another state, and thus a uniformity of definition might be expected. But apparently what is poison for mankind in one state is food for mankind in another state.

The conclusions of the courts are reflected in the following:

"A poison is an agent which when introduced into the animal organism, is capable of producing a morbid, noxious or deadly effect upon it."

"Any substance that, when taken into the system, acts in a noxious manner by means not mechanical, tending to cause death or serious detriment to health."

"A substance of definite chemical composition which when taken into the living organism is capable of causing impairment or cessation of function."

"Any substance which when taken into the body and either by being absorbed or by its direct chemical action upon the parts with which it comes in contact or when applied externally and entering into circulation is capable of producing deleterious effects."

Some dictionary definitions of poison are offered. But they do not bring us much nearer to a satisfactory idea of a poison.

"A general name for all substances which, when introduced into the animal economy either by cutaneous absorption, respiration or the digestive canal act in a noxious manner on the vital properties or the textures of an organ."—The Dunglison Medical Dictionary.

"A substance having an inherent deleterious property which renders it when taken into the system capable of destroying life."—Wharton & Stille Medical Jurisprudence.

"A substance which, on being applied to the human body, internally or ex-

ternally, is capable of destroying the action of the vital functions, or of placing solids and fluids in such a state as to prevent the continuance of life."—Black's Law Dictionary.

"A substance of definite chemical composition, which when taken into the living organism is capable of causing impairment or cessation of function."—Bouvier's Law Dictionary.

"Any substance which, when taken, applied to the body externally or in any way introduced into the system, is capable, without acting mechanically, but by its own inherent qualities, of destroying life."—Cyclopedia of Law.

"Any substance which, introduced into the living organism directly, tends to destroy the life or impair the health of that organism."—The Century Dictionary.

"In its scientific sense this word applies to any substance which, taken in small quantity into the body of a living animal, is capable by its chemical action, exerted locally or after absorption into the blood, of producing death or notable injury. This definition excludes substances which act mechanically, such as broken glass, or physically, as very hot water."—Century Dictionary.

Further definitions, selected from those elaborated by private authorities, are appended.

"A poison is defined as any chemical which when introduced into the body or generated within the body produces death or disease or permanently or temporarily impairs an organ that is healthy or apparently healthy."

"A poison is defined as any substance which when taken into the body in stated amounts, and usually in relatively small amounts, acting chemically, is capable of producing on ordinary persons, or an average person, death or grave injury to health."

"A poison is a substance, as we understand it, which when taken into the body, on account of its chemical constituent, seriously impairs or destroys the functions of some part of the body or it may kill, or simply impair."

"A poison is defined as any substance when introduced into the body in sufficient strength and in relatively small quantities and acting chemically is capable of producing death or serious injury to health in the case of an ordinary individual in average health."

"Toxicology is the science of poisons. A substance may produce deleterious results in several different ways. In the first place, it may act mechanically and produce disturbances in that manner. For instance, in the case of glass or other fragments, or by physical action as in the case of extremely hot water, or it may produce deleterious results by local chemical action which destroys the tissues with which it comes in contact, like sulphuric acid, or it may produce deleterious results by organized material which occurs in the system and produces detrimental results and it may act chemically upon the blood, or it may be carried by the blood to other parts of the body and there produce chemical action which is detrimental which is the case in true poisons; or substances can be taken in excessive quantities, substances naturally taken may also, when taken in excessive quantities, produce deleterious results by the increased quantity. For instance, you may take too much food of one kind or another."

It is plain to be seen that there is no unanimity of opinion in the best definitions at our command. Some definitions are so broad that one could hardly point out any single article and say, "It is not poison." Common salt is referred to by one of our prominent medical journals as follows: "A case reported in this issue calls attention to the well-known yet not always sufficiently recognized fact that sodium chloride, while the least toxic of the group of similar metal chlorides, *is a poison* which may be abused with fatal results." And from another issue of the same journal we learn that over doses of this same sodium chloride are commonly used in China as a means of committing suicide. One school thinks only of the *quality* of the physiological effect produced by any given substance; and if the effect is deleterious in any way then the substance is a poison. Another school thinks of the *quantity* of the effect produced; thus a small quantity of effect upon you might be beneficial, while a larger quantity of the same effect might be injurious. As an example a little strychnine might be beneficial, while more might be deleterious.

We should not overlook in our survey of the question the varying idiosyncrasy, or susceptibility of man and animals to certain articles. Poison Ivy is much more troublesome with some people than with others. The effects of buckwheat and strawberries on some people are familiar. Rabbits are said to withstand large doses of atropine. The hedge-hog is reported to withstand unusual doses of numerous articles that we commonly call active poisons. And are not birds quite indifferent to strychnine? These considerations only increase the difficulty of framing a satisfactory definition for poison, and at the same time increase the need for such a definition. There are hosts of articles generally regarded as harmless that should be classified as poisons if one is to follow the definitions, the laws, the court decisions, etc. It is not impossible to classify the various drugs and chemicals as to poisonousness, but no two people would do it alike. They would make up classifications widely different. Again the need for some one master classification is shown. And a proper national poison law would be such a master classification.

A proper national poison law would leave no doubt in the mind of the producer, dealer, or consumer as to just what articles are to be considered poisons and labeled and handled accordingly. With such a law it would not matter that one says chemistry and physiology know no substance as such which is deleterious to health, but every substance has a definite ratio to the weight unit of the human body below which it is without any effect, and above which it exerts its specific influence. It would not matter that some pronounce caffeine poisonous, while others proclaim it harmless. With a proper national poison law enacted everyone would be on an equal footing and one person would know as well as another whether any given preparation should be handled as a poison or not. In other words with a standard once set all would have an equal chance to live up to it.

Just what a national poison law should comprise is a subject that needs study. But certainly the law should be as definite as possible. It should not depend for its efficiency on such vague expressions as "active poison," "virulent poison," "acting in a noxious manner," "capable of producing deleterious effects," "liable to be destructive to adult human life," etc. If, as it appears, we can not now

define a poison, let us perhaps omit the definition and frame our law in some other way. Let us in the law enumerate the poisons by name. It will be a long list and an incomplete one. But to-day we have no list at all, so that even an incomplete list will be a step in advance. Let us authorize changes to be made in this list and additions to be made to it. By this means an article at first regarded as non-poisonous can later be put on the poison list. Our knowledge is constantly changing, so our poison list should. An article may be used some years before it is learned that it is habit-forming. In the beginning it would not be found on the list, but subsequently should be.

The law might be made to say such and such things are hereby declared poisons and must be treated in such and such ways. Just as our tariff laws contain almost unending lists of articles that must pay duty so and so. Perhaps classifications could be embodied in the law, as for example Schedule A—Habit-forming drugs, Schedule B—Heart stimulants, Schedule C—Emmenagogues, etc. But these schedules or lists are not sufficient without the individual poisons being mentioned by name (and perhaps also by quantities when in combination). If this provision could be made so that the three Secretaries (Agriculture, Treasury and Commerce) by means of appropriate advisers could keep the schedules up to date, we should have an effective statute.

Such an arrangement is not wholly new. Canada now has a law somewhat on these lines. But with us there would be much in it that is new. It will be necessary to decide what should be considered poisonous for practical purposes. It is easy to decide what is poisonous on purely theoretical grounds; but we live in a practical world. Still we have already made beginnings in establishing standards of poisonousness and we can go on. You are doubtless familiar with the interesting work along these lines using strophanthin made according to Thoms as a standard for comparison. A commission or a committee under the direction of the Bureau of Chemistry or perhaps of the Public Health Service would no doubt be able to do good work on this subject. It is to be remembered, however, that in a national poison law the aim is not to establish fine medical distinctions in regard to poisons, but to establish a working basis, a practical basis for traffic in poisons in interstate commerce of such a nature that consumer, dealer, and purchaser will be equally assisted and protected.

DISCUSSION.

H. H. Rusby, of New York, said he would like to add a definition: A poison is any substance which, introduced into or applied to the bodily tissues, is capable of producing death otherwise than by mechanical action.

C. T. P. Fennell, of Cincinnati, said the English law placed it on a much broader basis. The claim there was, that any substance which entered the human body and deranged any function was a poison. There was one substance which, recently, caused a great deal of trouble in Cincinnati, a substance not mentioned in any of these laws—barium chloride.

C. A. Mayo, of New York, said the question of poisons happened to be at an acute stage just now, the postal regulations regarding the shipments of poisons having been entirely upset by recent United States Court decisions, and the postal authorities seemed to be entirely at sea as to what should or should not be permitted in the shipment of poisons by mail. The regulations heretofore in force gave permission to shippers of poisons to ship only to dealers, but the United States Court had decided that these regulations were illegal. It seemed to

him that the Association was in a position to give counsel and advice to the authorities, and he thought it might help the situation to offer such advice; therefore, he proposed the following resolution for discussion in connection with this paper:

"WHEREAS, The regulations regarding the shipment of drugs by mail are vague, indefinite and unsatisfactory, and

"WHEREAS, The drafting of such regulations requires special knowledge of pharmacy and its problems. Therefore, be it

"*Resolved*, That the Chairman of this Section appoint a special committee of five to prepare such regulations and submit them to the postal authorities for consideration."

J. H. Beal, of Scio, Ohio, said he thought acknowledgment was due Mr. Murray for the very valuable paper he had presented. He knew something of the labor involved, because, some fifteen or twenty years ago, he had undertaken to find a definition of the word "poison" which could be used in the drafting of a poison law, and had searched diligently for all possible information on the subject. He had finally come to the conclusion that Mr. Murray seemed to have come to here, that the physiological or scientific definition of poison, based upon physiological action, would not do for a legal definition; that a legal definition of poison must be more or less arbitrary. Then he considered the question of whether or not such definitions as were found in the Pennsylvania Poison Law could be used, making the question of whether it should be labeled poison depend upon the quantity required to produce death, but the toxicologists were so much at variance upon this point that he had discarded the idea as impracticable.

He had finally drafted a bill, which had been enacted into law in the State of Ohio, and was still in force there. This law did one of the things which Mr. Murray had recommended, it attempted to enumerate the poisons. It began by stating that "The following substances shall be regarded as poisons:" and after enumerating a list of such articles, provided a series of exceptions, excluding certain insoluble substances that had never been known to produce poisonous or fatal results. Further study had convinced him that a satisfactory legal definition of the word "poison" would require the adoption of a standard toxicity unit—say, for instance, the minimum lethal dose in milligrams which would occasion the death of a white mouse of standard weight. He thought by experiment along this line a standard toxicity unit could be developed, and then the law could state that any substance which had a toxicity value of a specified number of these should be deemed a poison. Mr. Beal concluded by saying that he would demur strongly to Mr. Murray's suggestion that any body or committee of men be permitted to extend the list of poisons or take away from it.

H. P. Hynson, of Baltimore, moved to refer Mr. Mayo's resolution to the House of Delegates. He said he was always glad when he found that anybody else entertained an idea or conclusion that agreed with his; it always encouraged him. He was particularly glad to hear Mr. Beal and the author of the paper say that it was desirable to be specific in this matter of poisons, and refuse to accept any general definition. He would especially impress upon the young men in pharmacy that they should stand for a definite and specific definition as to poisons. He also thought that narcotic and anti-narcotic legislation should be likewise specific. He told of the troubles they had in Baltimore, with three anti-narcotic laws, a general State law, a poison law, and a city ordinance. This had resulted in great confusion for a while, but he had finally succeeded in getting out a line of interpretations which, in spite of prejudice, had been accepted. They had gone to their state's attorneys and judges, and asked them to accept this as an interpretation of the law, and thought that when they got them to accept such specific description of each drug their troubles would be pretty well over.

J. F. Windolph, of Norwich, New York, was impressed with the importance of taking some action along the lines Mr. Mayo had suggested. He had in his possession an official definition from the Postoffice Department as to what was considered a poison, and he thought the members would be impressed with the idea that the Postoffice Department needed some expert advice in the enforcement of its amended regulations. The department did not wish to carry out the law along technical lines, and it had issued a rule to the effect that a medi-

cine would not be considered a poison if it did not contain sufficient poison to render the composition a poison.

Adverting to his resolution just offered, Mr. Mayo said he wished to forestall objection to it, or any attack by Mr. Hynson, by saying that this resolution did not involve a question of policy on the part of the Association, and he hoped the Chairman of the House of Delegates would agree with him in thinking that it was simply asking for the appointment of a special committee of a technical nature. He thereupon re-read his resolution, and said that the definition just recited by Mr. Windolph gave a good idea of what pharmacists had to go up against when it came to the postal authorities.

W. C. Abbott, of Chicago, said it seemed to him that, as an example of vague legislation—of which there had been a great deal—this attempted poison legislation stood out first. He regarded the proposed regulation of the Postoffice Department to declare all poisons unmailable as little less than silly. It was an attempt to regulate the practice of those who knew a great deal more about the substances classed as poisons than those making such regulations. He believed that the purpose of the proposed regulation of the department was intended to protect the public, but this piece of "bureau legislation" was so widely general that it stood as a dead letter in practice, because it could not be enforced; or, if enforced, could only be so enforced to the detriment of the many, and would not be in harmony with the real purport of the law. He held that neither the pharmacist nor the physician should be handicapped in the manner he procured or prescribed poisonous substances, or potent remedies of any sort or character. What mattered it, in his business whether he got it by mail or express. At last, it was up to the educated pharmacists and physicians to handle this question properly. He heartily seconded the resolution offered by Mr. Mayo.

Speaking again on the subject, Mr. Windolph said he understood that the Criminal Code, section 217, excluded poisons, but gave the Postmaster General power to formulate certain rules and regulations for the admission of certain of these poisons, and the regulation which had been amended to conform to the court's decision, apparently did not admit any medicine containing poison, because the words "containing poison" had been omitted from the regulation, which now read that "medicines and anaesthetics" might be admitted. It was further provided that the word "medicine" should not be understood as meaning "poisons;" and according to the law and regulations attempting to make an exception thereto, it was not possible to legally mail any preparation containing a trace of poison. However, it was the purpose of the Postoffice Department to permit the mailing of preparations containing a minimum amount of poison. They were very much in the dark, he said, and didn't know just what they did mean. The definition had been given to him, that what was meant was a poison which, in the ordinary dose, was not fatal.

Mr. Murray said this discussion simply bore out the position that no one knew what a poison was, and the pharmacists did not know where they stood in this matter. His idea about the Postoffice Department was that they knew no more than the pharmacists, although they would like to know. He had with him a copy of the ruling of the department, to which Mr. Windolph had referred, which read: "Medicines containing a small proportion of poison are mailable, and medicines containing poison to such a degree as to make the composition a poison are not mailable." He said he did not understand what Mr. Beal meant by saying that this was not desirable.

Mr. Beal replied that he did not deem it advisable to give to any bureau the right to arbitrarily extend or diminish the list of substances which shall be deemed poisons, i. e., that he did not believe in "bureau-legislation." He was not referring to the postal regulations.

DRUG PRODUCTS—THE LAW AND THE LABEL.

LOUIS EMANUEL, PITTSBURG, PA.

How to make a statement of the strength, quality or purity on a label for drugs which differ from the official standards, in such manner as to be plain, has never been judicially determined. It is claimed by some that a simple declaration of the actual strength is sufficient, while others contend, that some qualifying statement should also be made in order that the purchasers may not be misled.

The labels employed by some manufacturers and dealers give evidence of their conviction, that a simple statement of the strength of the drug, in such cases, does not comply with the law. Examples:

"Aconite Root

Standard Strength U. S. P.....0.5% Aconitine
Assayed Strength .....0.485% Aconitine

"Elixir of Ammonium Valerate

Alcohol, 17%

Each Fluidounce contains

Ammonium Valerate .....16 grains
Tincture of Vanilla ..... 2 minims

This elixir is preserved with alcohol and glycerin. The chloroform of the N. F. preparation has been omitted and the elixir colored with carmine."

"Beef, Wine and Iron

Alcohol 18%

This preparation should not be confused with that of the National Formulary, as it is made from a different formula.

Each fluidounce represents 15 grains of Extract of Beef in Sherry Wine with about 4 Grains of Iron and Ammonium Citrate."

Section 7 of the Federal Food and Drugs Act provides: "That no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated * * * if the standard of strength, quality, or purity be plainly stated upon the bottle, box or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary."

Section 8 provides: "That the term 'misbranded,' as herein used, shall apply to all drugs, or * * *, the package or label of which shall bear any statement, design, or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular."

The label for a drug sold under an official name, which is either above or below the standard, having upon it a declaration of strength only, is plainly misbranded, because a single declaration of strength does not provide a plainly stated declara-

tion of the quality. Moreover, when such a label carries a guaranty, the label is misleading. The standard is stated and the drug guaranteed. Nothing appears on the label to show the purchaser what the standard should be. He does not know what the standard is and, naturally, concludes that the article is guaranteed of standard strength, but is sadly misled. In fact just such a case as this was brought to light in the work of the Pennsylvania Board of Pharmacy.

A prescription for Essence of Pepsin, N. F. was sent to a pharmacist who filled it with a nearly half-strength drug. Later this pharmacist was cited for a hearing before the board, at which he set up the claim that he was in the right and safe from prosecution because the essence he used was guaranteed by a reputable manufacturer. The difference in a guaranty *for what the product is sold for,* and a guaranty that the product is of *official standard of strength and quality,* misled him. This would not have been possible, if a declaration of the quality had appeared upon the label of the article, or a statement such as appears on the label for the beef, iron and wine, or the elixir of ammonium valerate quoted herein.

It may very properly be said that a pharmacist should be sufficiently familiar with official standards, to readily detect a drug of deficient strength when a simple statement of strength appears upon the label. But is this law for the protection of the pharmacist only? How about the physician and the general public, are they expected to know the standards? What constitutes a plain statement of the standard of strength, quality, or purity, within the meaning of the law?

For our answers to these questions we must look to the intent or purpose of the provision. It can have no other purpose than to protect the consumer and acquaint him with the fact, when he is sold an article that is not standard. A label bearing a statement of strength by which only the pharmacist may determine the actual strength and quality of the drug it represents, and that, perhaps, after making a careful calculation, cannot possibly afford the protection this provision is intended to give, to the ordinary every day purchaser of the product for his own consumption. The following illustrations will show how some manufacturers attempt to comply with this very important provision as to the label, and how the public may be misled thereby.

"Essence of Peppermint
Contains 80 percent PURE PROOF SPIRIT
19.75 percent Distilled Water
Pure Oil of Peppermint and herb, a trace.
Guaranteed under the Food & Drugs Act, June 30, 1906."

"Tincture of Iodine
Contains 45. percent Pure Alcohol.
3.51 percent Pure Iodine
0.5 percent Pure Potassium Iodide.
Guaranteed under the Food & Drugs Act, June 30th, 1906."

Under labels as above, drug products are not guaranteed for their PRIME quality. They are really guaranteed to be of inferior quality. The labels are not plain as to this, but what average purchaser of such 10 percent bottled prod-

ucts as these were taken from would ever know how utterly deficient in strength and quality they were?

The labels declare the strength, but say nothing plainly about the quality. They are not adulterated drug products, within the meaning of the law, but they are misbranded, which is, also, a violation of the law.

It is evident that there is need for a court decision in this matter and a possibility of a common sense rendition, as to what a plain statement for sub-standard drugs should consist of, is apparent, when we consider what Chief Justice Claybaugh, in the Antikamnia case, says regarding regulations, viz.:

"Conceding for the purpose of the statement of this case, that this is not a quasi-criminal statute, but purely a remedial one, if that be true then it is the duty of the court to construe it as to give effect to the purposes and objects for which it was passed.

"I have no doubt that these secretaries could, with great propriety, make regulations that would more effectually carry into execution the purposes and intent of the law makers. That being so, what is the fair construction of the act, or does it need any interpretation?

"The right to interpret an act in conformity to the purposes and objects of that act applies only where the act is not perfectly plain or is not perfectly apparent.

"Then the courts can give such interpretation to it as will carry out and gratify the purposes of its passage. Interpretation, as I understand it, does not mean that the court can add anything to language which is plain."

This would seem to encourage a hope that the position taken by the Pennsylvania Board may be sustained when properly presented to the courts.

Regarding regulations. The Federal law does not provide for a guaranty and serial number; nor does it provide, that a label shall make reference to a guaranty; nor does it provide that a guaranty shall be filed with the department of agriculture, but the regulations adopted, do provide for, not only the guaranty and serial number, but also the manner in which these are to be stated. It was found when left to themselves, manufacturers misapplied the object of the guaranty and made their labels read "Guaranteed by the U. S. Government."

Now if it is legal and proper to adopt regulations as to the manner in which a guaranty shall be made, and stated, it is reasonable to hold that regulations may be adopted which shall provide for a plain statement for labels on sub-standard drug products, in order that purchasers may not be misled.

SOME PHASES OF A PHARMACIST'S DUTY TO THE PUBLIC.

ZADA M. COOPER, PH. G., IOWA CITY, IA.

It is fair to suppose that all men realize that they owe something to the community in which they live. They believe that it is their duty to be good citizens but the ideas of what constitute good citizenship are as far apart as the poles. It is without doubt too often true that men think it is sufficient to be honest and honorable in their dealings with others, to pay their debts and keep out of the penitentiary. There is a considerable number who do not even feel it a duty to exercise the right of suffrage. In brief, it is a passive sort of good citizenship

that they practice, feeling no compulsion to engage in active service for mankind in general or their neighbors in particular, and, I suspect that pharmacists are not altogether innocent of such inactivity.

Lest such a criticism from a woman seem rank presumption which it probably is, I hasten to say that it is of only one specific point that I wish to speak and that point is just as applicable to myself as to others. I refer to what we as pharmacists should do toward the education of that part of the public with whom we come in contact. We shall all concede that we are our brother's keeper in so far as it is necessary to supply him with only good drugs and medicines and to refuse to sell him dangerous habit-forming drugs, but how many of us feel any necessity to help him to a better understanding of these things, how many of us try to pass on useful knowledge? Do we believe with Huxley that while, "We live in a world which is full of ignorance and misery" it is "the plain duty of each and all of us to try to make the little corner he can influence somewhat less ignorant than it was before he entered it."

Possibly there is no subject of which the public is so ignorant as medicine, unless it be religion. Not even in religion is there more superstition, more absurdity, more need for the exercise of common sense and good sound reasoning.

Little can be accomplished in the way of reform by legislation or otherwise along any line without an awakened public sentiment and before public sentiment can be aroused, the need of reform must be seen, there must be knowledge, education. Take for example, the patent medicine evil. It can never be eliminated without a campaign of education. Just as long as the public reads the alluring advertisements and believes the extravagant claims, we shall have the thing to contend with. Efforts to get restrictive legislation come to naught so long as the people believe in the efficacy of such remedies. Until they learn that most of them are worthless if not dangerous they will continue to use them. Some lay magazines have done much toward exposing them but there is still a vast amount of ignorance and, in my opinion, it is the duty of the pharmacist to do what he can to reduce it. It is not expected that we shall be able to eliminate the sale of patents entirely or that we shall refuse a customer who insists. We cannot bring in the millennium instantly but it is unnecessary to push that branch of the business. Even if we are to consider it only from the mercenary view point, the same effort expended on some other department would bring better results.

Of course we all understand the difficulties that will be encountered. For various reasons, some people resent pharmacists offering information. It may be the implied ignorance, an unusual amount of conceit, or the impression that it is an interference in one's private affairs. Whatever the cause, it involves the exercise of tact but so does the successful conduct of any part of your work. In fact any profession, any business, any trade, in which one must deal with people, I care not what it is, requires that same quality if one is to get on. The ability to estimate human nature is very essential in any branch of the pharmacist's calling, hence there can be no good reason for not bringing it into use here. Then as opportunity offers, should not a pharmacist teach many of the dangers of self-medication?

Should we not go a step farther and try to explain that self-medication usually

involves self-diagnosis. If they can be made to understand that standard remedies of well known therapeutic value are best, perhaps they can be taught also that they cannot diagnose their own ailments and that that is just what a physician is qualified to do. Attention can be called to the fact that a prescription is a safeguard against error because at least two people, the physician and the pharmacist see it before the medicine gets into the patient's hands. The public should know that if a dispensing physician makes a mistake, it is difficult to prove and so there is less chance of recourse. Perhaps we hear it said, "The Lord giveth and the Lord hath taken away" when as a matter of fact the Lord had nothing to do with it. In the case of the physician who prescribes, errors are much more easily located and the prescription itself is evidence. What is still more important than being able to trace mistakes is the fact that error is much less likely to occur. If it be the physician's the pharmacist should detect it, if it be the pharmacist's the checking systems usually employed in reliable pharmacies reduces the chances to a minimum. I am sure that pharmacists have no desire to antagonize physicians but these are a few of the things the public has a right to know, things upon which they have thought little but knowledge of which would materially affect the attitude of intelligent thinking people. Another of these little known facts is that the pharmacist's stock must conform to the requirements of pure drug laws but physicians may dispense what they please and no one is the wiser.

I believe that teachers of salesmanship agree that one of the essentials is a knowledge of the stock. If the sale of ordinary merchandise is helped by knowing all about it and subsequently passing on to the customer at least a part of that knowledge, surely the principle is just as applicable to the sale of many things handled by the pharmacist, even to many drugs themselves. I believe the old idea that the less a man or woman knows about medicine the better, is all wrong. We shall grant that technical and professional information is only for those educated in the profession but outside of this there are a great many interesting and helpful facts about even the common household remedies that can easily be passed on to the customer. In an article by Mr. Raubenheimer published not long since he gives an excellent example of how historical information about sulphur, cream of tartar and Rochelle salt displayed on placards in the show window aided in the sale of lozenges compounded from these ingredients.

Having good laws regulating the practice of pharmacy is a benefit to us but many of the laws were enacted primarily for the protection of the public. So what is good for the public in the end benefits us—the knowledge we pass on to them brings returns. "Cast thy bread upon the waters" is not without its application here. Some one will say that it does not pay to go to so much trouble, that it is a thankless task. I believe not, I believe it will react to benefit us either as druggists or as citizens. The simple fact that you know increases the respect for you and your calling. Every man owes it to himself to bring his vocation to a higher plane of honor and usefulness. As educated men and women we owe the community more than the uneducated. Some one has said that, "Education is the development of power to bring things to pass for the common good." If that be true, we do not know that we are educated, we have no right to the

title until we make use of our power, latent though it may be, to do something for the common good.

There is no lack of opportunity to exercise this sort of good citizenship. If there seems to be none, it is because we are so self-centered as to be blind to our opportunities. In advice about sanitation and methods of disease-prevention we should be able to do much toward assisting public health departments. It has been said by one of our own number that "no trade or profession of the present day presents greater opportunity for serving the human family by relieving suffering and causing the dissemination of useful knowledge than that of the pharmacist."

Apparently physicians themselves believe that the public needs information and have claims that those who possess the information have no right to ignore. Not long since an editorial in the Journal of the American Medical Association emphasized the people's right to a thorough education in the "essentials of public and personal hygiene and sanitation" and "to correct information about medical progress." Another physician writing recently says that "the education of the laity on medical matters is daily becoming a subject of wider interest and greater importance. Preventive measures are based in great part upon a thorough medical education of the public." Among those who are most likely to be asked to express opinions concerning medical questions, he includes the druggists and thinks that druggists who are asked for advice or to express an opinion as to the meaning or seriousness of any symptoms can be of much assistance to physicians, that he has done as much perhaps as the physician himself if he advises against the use of remedies that may be of doubtful value and succeeds in bringing the case to the physician's care.

INTRODUCTION TO THE REPORT OF COMMITTEE ON PATENTS AND TRADE-MARKS.

F. E. STEWART, M. D., CHAIRMAN.

In June, 1881, your chairman, then attending the annual meeting of the American Medical Association for the first time read before the section dealing with the Materia Medica, a paper entitled, "The Materia Medica of the Future," and in connection therewith he laid down as a declaration of principle the following resolution:

Resolved, That it is contrary to the spirit of the code of ethics for a physician to prescribe a remedy controlled by a patent, copyright, or trade-mark. This, however, shall except the use of a patent upon a process or machinery for manufacture. It shall also accept the use of a trade-mark if the article so marked is provided with a technical name, and a working formula, under which any person may manufacture and sell it.

This resolution was rejected by the Judicial Council on account of its exceptions, it being considered contrary to the spirit of the code of ethics for physicians to habitually prescribe, or in any other way endorse the commercial control of anything required for the prevention, cure or mitigation of disease. It is unnecessary to add that if the medical profession had been true to its obligations,

pharmacy and drug therapeutics would today possess much higher standing in the estimation of the public than at the present time.

Long before the advent of the modern manufacturing houses engaged in the pharmaceutical field the so-called "new remedy" business had its birth in the retail drug store, and was known as the "specialty" business. Many of the so-called specialties originated as favorite prescriptions by leading members of the medical profession. Some were labeled with descriptive names, others with semi-descriptive coined names which were generally adopted as proper titles. As a rule labels were provided with names of diseases and doses, frequently with circulars setting forth their uses, all intended for the convenience of the self-medicating public.

As long as this method of doing business was confined to the retail druggist it was not only considered legitimate, but proudly heralded as "elegant pharmacy," and the reputation of the pharmacist among the members of his guild was largely dependent upon the sale of his specialties. The medical profession prescribed them, the demand created thereby increased their sales, and the endorsement of physicians gave sanctity to the business.

But when the country became over-run with unlicensed practitioners parading as manufacturing pharmacists and chemists, who advertised similar preparations in the medical journals and sent out their detail men to interview the doctors, then a mighty howl went up from the retail druggists, and the Brooklyn Formulary, which afterwards become the National Formulary, was devised in retaliation. Shortly afterward a corresponding howl was raised by the doctors. They commenced to take exception to the methods of labeling, circularizing and advertising. Attention was called to the fact that physicians who prescribed this class of products, prescribed themselves out of practice, and sent their patients to the nostrum manufacturers for treatment. The advertisements were characterized as tissues of fraud, humbug and lies. Then it was discovered that some of these products were patented, others commercially controlled by registering their currently used names as trade-marks, and others by secret or semi-secret formulas and processes. These discoveries brought out the fact that the "specialty" business was only another branch of the so-called "patent" medicine business, the principal difference between them being that one class of products was advertised in the secular and religious press to fool the people, and the other class advertised in the medical journals to fool the doctors.

Your chairman graduated from the Philadelphia College of Pharmacy in 1876, under the tuition of preceptors prominently identified with the "specialty" business, and, after graduation, went into the same business as a proprietor, later graduated at the Jefferson Medical College, class of 1879, sold out to one of the prominent manufacturing houses, entered the practice of medicine, and made an arrangement for receiving royalties for new materia medica products of his own introduction. His literature was reprinted from the medical journals by said house and widely circulated to the medical profession. The products were not patented, or "trade-marked," and full knowledge concerning their method of manufacture was published in the medical press, but in spite of such precautions to be ethical, immediately the leaders of the medical profession in New York took exception to this action upon the part of your chairman and the

manufacturing house referred to. As both had gone into the arrangement in good faith, both now united in an attempt to solve the problem presented by the so-called "new remedy" business.

The "propaganda for reform" agreed upon included the following:

First.—A published platform declaring the policy of the propaganda, and including the objections urged by the profession against the new remedy business.

Second.—The advocacy of the establishment of a national bureau of materia medica, or board of control, under the central government at Washington, provided with laboratories for materia medica research, and including government experts employed in the various government departments dealing with medicinal drugs, chemicals, or preparations of the same, and also including the physicians in the Army, Navy, and U. S. Marine Hospital Service engaged in research work.

Third.—The investigation of the materia medica of the world by said government bureau to ascertain what products were being used by the various nations, peoples, and tribes, with the object of adding the same to the materia medica collection in the National Museum, and whenever any product was discovered appearing to be worthy of further research, the same to be investigated by the laboratory and its claims proved or disproved.

Fourth.—The organization of a National Pharmacologic Society, representative in character, including members of the medical and pharmaceutical professions, and manufacturers engaged in the pharmacal and chemical industries, also editors and publishers of medical journals, the special object of the association being to co-operate with the bureau or board of control.

Fifth.—The free publication of working bulletins by said bureau or board containing all available information concerning each product undergoing more complete investigation, the same to be sent to clinicians throughout the country for the therapeutic test of said products, in the form of properly prepared and standardized preparations, to be furnished by the government without charge.

Sixth.—The publication of a monthly journal, an annual report, and a complete compilation of the results of work done in book form.

Seventh.—The abolishment of commercial monopoly of materia medica products except in so far as limited monopolies may be obtained by the proper application of the patent and trade-mark laws.

Eighth.—The establishment by the manufacturers of Scientific Departments manned by persons skilled in the arts of medicine, pharmacy and chemistry, including physicians, pharmacists, chemists, physiologists, botanists, bacteriologists, etc., such departments to be professionally organized as a part of said pharmacologic society, and working in co-operation with the bureau or board of control.

Ninth.—The introduction into the Pharmacopœia of methods for standardizing galenicals, thus extending and making more practical the work of the revision committee.

The results of this propaganda have been far reaching. The Smithsonian Institute endorsed the plan for an investigation of the materia medica of the world under governmental auspices. It was also endorsed by the Surgeons General of the Army, Navy and U. S. Marine Hospital Service, also by the Alumni Associa-

tion of the Philadelphia College of Pharmacy. It was discussed by the Philadelphia County Medical Society and approved by H. C. Wood and other prominent men in the medical profession both in civil and official life. The American Medical Association memorialized Congress on the subject in 1891. The A. Ph. A. in a set of preambles and resolutions endorsed the policy mapped out by our Committee on National Legislation in 1896 in relation to the commercial control of materia medica products. This act was in accord with the Richmond resolution. The Journal of the American Medical Association editorially endorsed a modification of the bureau plan presented by your chairman in April, 1901. Several of the large manufacturing houses adopted the scientific department idea, and also adopted the working bulletin system under that or some other name. The U. S. Pharmacopœial Convention increased the scope of its standardization work by introducing standardized galenicals in 1890, and made further additions in 1900. In 1901 a national pharmacy company was incorporated in New Jersey and organized in San Francisco, and a national bureau of medicines and foods organized to support it. This plan was cordially approved by the leaders in pharmacy and medicine on the Pacific Coast, but afterwards abandoned to take part in an organization under the auspices of the A. M. A., and A. Ph. A. The joint committee reported favorably but the plan was defeated, only to rise again in another form as the A. M. A. Council on Pharmacy and Chemistry.

It is safe to assert that the combined manufacturing houses of the United States engaged in the pharmacal and pharmaco-chemical industries publish and distribute to the medical profession at least fifty tons of literature annually relating to their products. This probably represents two or three million or more separate working bulletins, pamphlets or circulars. The question is, are these publications disseminating truth or error? If truth, then the publication represents a work most beneficial and salutary. If error, then these houses are misleading the medical profession, exploiting the sick for gain, and are guilty of a heinous crime against humanity.

The object of the scientific department idea referred to in this report, with its working bulletin system for the distribution of scientific literature concerning the newer materia medica, the same to be published under the censorship of a bureau or board of control, representing the several interests involved, is in line with the professional society idea in which individuals contribute the results of their experience and observations for the benefit of the profession, and submit their contributions to the censorship of their peers, who censor the same in organic capacity. The literature of contributors to the professional societies, describing results obtained from original research, may be copyrighted, but the results of their investigations are freely given to the profession. Progress in the science and arts of medicine is thereby promoted because each member of the profession who does his duty uses the knowledge thus contributed and publishes the results of his observations also, thus verifying or disproving the findings of the original contributors.

The object of the patent law is to promote progress in science and useful arts. This object is now being defeated by the way our patent and trade-mark laws are being interpreted and applied in the protection of alleged materia medica inventions. As not over one-tenth of one percent of the alleged new

remedies commercially introduced during the past thirty years and protected by patents and so-called trade-marks have proved of sufficient merit to justify the experiments upon the sick entailed, it is evident that these laws have been misinterpreted and misapplied. Is it not about time that we as physicians and pharmacists enter our protest against such travesty of law? And in making this protest, could we make it more effectively than to adopt a plan for directing this great commercial propaganda, employed for creating a demand for these alleged new remedies, into proper educational channels for the circulating of accurate information concerning them, by establishing a censorship over the publication of this literature—a censorship voluntary and representative in character on the part of the manufacturers, and co-operative on the part of the medical and pharmaceutical professions?

Place the professions where they can properly co-operate by making the propaganda professional in character and there will be quick reciprocity on the part of professional men. But the professions cannot co-operate with a plan for using the professions and the public for selfish purposes.

Finally, the professional ideal of pharmacy includes autonomy on the part of the profession. Without autonomy there can be no profession of pharmacy. We have our professional schools, press and societies, but are lacking in the essential qualification necessary to gain for the vocation recognition as one of the liberal and learned professions, namely, autonomous censorship and control over the publication of literature relating to the introduction of new materia medica products to be used by the medical and pharmaceutical professions. Such autonomy is secured in the publication of information relating to the older materia medica by the Pharmacopœial Convention and its Committee on Revision. Why not establish a similar board of control for the censorship of literature relating to the newer materia medica?

From the above statement it will be seen that the question of patents and trade-marks as applied to materia medica products is entirely subsidiary and dependent upon questions of materia medica standardization, professional autonomy, and medical and pharmacal education and license. Some of these questions are:

Who shall practice medicine and pharmacy, licensed practitioners duly qualified by education and license from a board of examiners, or unlicensed practitioners who have set up as manufacturers and are practicing at wholesale at long range and without diagnosis?

Who shall control the teaching of therapeutics as applied to the newer materia medica?

Who shall decide questions relating to the preparation and standardization of these products?

How shall the patent and trade-mark laws be so applied as to promote progress in materia medica science, advance the legitimate practice of the arts of pharmacy and drug therapeutics, and protect the public from the errors of dishonest commercial exploitation?

How shall charlatans and pretenders be prevented from availing themselves of the protection of these laws in carrying on a dishonest commercial business parading under the guise of scientific pharmacy and chemistry?

Is it not apparent then that we need some kind of bureau or board of control or society, representing the several interests concerned, in which the autonomy

of the medical and pharmaceutical professions can be vested in relation to the newer materia medica just as they are now vested in the U. S. P. Convention and its committee of revision in relation to the older materia medica—a bureau or board working in co-operation with the professions and manufacturers for the promotion of the common good and public welfare? Can the American Pharmaceutical Association take up the work and secure the aid of the manufacturers in establishing a home for the Association with proper laboratories and facilities? Ought the work to be assumed by the Pharmacopœial Convention at its next decennial meeting? Or would it be a better plan to have the work taken out of the hands of the professions and assumed by the Federal Government? Upon the answers to these and other questions relating to professional autonomy is dependent the answer to the patent and trade-mark question.

There seems to be so much misunderstanding in regard to the object of the "propaganda of reform" advocated so persistently and consistently since 1881, that your chairman feels it incumbent upon him to make this preliminary statement.

REPORT OF THE COMMITTEE ON PATENTS AND TRADE-MARKS.

The question of patents and trade-marks in its relation to medicine and pharmacy is far more complex and comprehensive than the superficial student realizes.

The physician and pharmacist have already been granted a monopoly of medicine and pharmacal practice. This grant was given in exchange for services of a highly altruistic character. There is no justification for either calling, except to the extent that the practitioner is able to prevent disease, relieve suffering, and heal the sick; and the function of the pharmacist is to prepare medicine for the physician to use, also to meet the demands of the public for medicine for self-medication so long as these demands are within reason.

Why should the government grant to the ignorant and venal manufacturers and dealers in drugs the right to the exclusive sale of certain materia medica products on the ground that they are "new and useful inventions and discoveries" in the treatment of the sick, and thereby create and foster great medical monopolies conducted in an unfair competition with the medical and pharmaceutical professions, and in a manner inimical to the public health?

In reply to this question we are constantly confronted with the answer: "What are you going to do about it?" If the medical and pharmaceutical professions would get together and ask Congress to do something about it, it would soon be done. As stated by one of our prominent senators: "Congress is always ready to listen to the advice of the learned professions, especially in regard to legislation concerning the practice of these professions. That is what Congress is here for. But we as legislators can do nothing until you, as professional men, agree as to what you want done."

Contrary to the general impression, the inventor does not possess a natural right to the exclusive use of his invention. The right, when it exists at all, is a creature of statute and grant, and subject to the conditions imposed by the

statute and the grants. The government is under no obligations to grant inventors the exclusive right to their inventions or discoveries. The object of giving such grants is to promote progress in science and useful arts.

Is the patent system now in vogue, as applied to medicine and pharmacy, promoting progress in the science of materia medica and in the arts of pharmacy and drug therapeutics? When it is considered that thousands of alleged new remedies have been introduced during the last thirty years and not one-tenth of one per cent of them has proved of any special therapeutic value; when it is considered that this introduction represents hundreds of thousands of useless experiments upon the sick by physicians in private and hospital practice, and many times that number by the self-medicating public, it is evident that the question may be properly answered in the negative.

Why should materia medica products be patented at all? Apparently the only persons who have profited from these patent grants have been the manufacturers of the patented products and the medical journals accepting their advertisements. It is well known that, as a rule, these advertisements are misleading. In no line of business is the principle underlying the motto *"caveat emptor,"* (the purchaser beware) been worked to such an extent as in the introduction of alleged new remedies by advertising.

The system has debauched the medical and pharmaceutical press, has seriously injured medical and pharmacal practice, has thrown pharmacy and medicine into disrepute with the public, and has proved a serious detriment to the public health. The medical press itself would be far better off under a system of open competition between manufacturers of new materia medica products. Take diphtheria antitoxin for example, it is an open product, consequently there are a number of manufacturers each contributing to the advertising columns of the medical journals. Adrenalin, on the contrary, is a closed product controlled by a product patent and for seventeen years there can be but one brand of it and therefore only one advertiser. Why should we sacrifice the professions of medicine and pharmacy, and the public health for the advantage of the manufacturers of questionable therapeutic novelties, and medical journals subsisting upon their advertising patronage? Why should not the system be wiped out altogether?

Most foreign countries prohibit the patenting of materia medica products, but as a rule permit the patenting of processes and machinery for their manufacture. Germany has been one of the leading countries in this respect. But now Germany will probably modify its patent law to be in line with the United States patent law, so that all of the arguments based upon the example of Germany will, in that event, fall to the ground.

Fortunately the advertising fraternity are waking up to the menace threatening the advertising business due to the misleading character of advertising in general. "Printer's Ink," the well-known organ of the advertising fraternity, is advocating a Bill for the prevention of misleading advertisements. This bill, or legislation founded thereon has already been enacted in several of the states, and it is hoped that it will be universally adopted by all of the states of this Union.

The Shirley Bill, recently passed by Congress, has for its object the suppres-

sion of misleading advertising in so far as it relates to foods and drugs in interstate commerce. If these laws are properly enforced the result will be to make the advertising of medicines as now carried on by some manufacturing houses exceedingly unprofitable, both as to reputation and financial returns.

One of the most important points in regard to the patenting of materia medica products for the protection of the commercial introduction by advertising is this, namely: materia medica products cannot be properly introduced by advertising. The only way they can be introduced in such a manner as to promote progress in the science of materia medica and the useful arts of pharmacy and drug therapeutics is by the co-operative investigation of experts in the various branches of knowledge upon which materia medica science depends.

The services of experts in pharmacognosy, pharmacy, pharmacodynamics, therapy dynamics, and pharmacotherapy are required for their introduction. It is necessary to develop a knowledge of their source or genesis, physical and chemical properties, methods of selection, preparation, reservation, compounding and dispensing, and also a knowledge of their comparative value in relation to the older products of the materia medica used for similar purposes. This in turn requires co-operation between the laboratories of the universities, government institutions and manufacturing houses engaged in the legitimate pharmacal and chemical industries. Therapeutic verdicts concerning new medicinal products can only be obtained by the co-operative investigations of many competent observers extending over years of time, and conducted under conditions of environment sufficiently differing as to climate and nationality so as to eliminate the personal equation. It is manifest that this is an altruistic work in which all co-operate for the common good, and that the results of the co-operative work belong to the professions of medicine and pharmacy, and to the public, and do not belong to individuals for their exclusive use. Why should we permit individuals, firms and corporations to monopolize common property for personal gain?

Taking the above facts into consideration, it would seem that the American Pharmaceutical Association should consider the subject of materia medica monopoly from the point of view of the public, and not from the narrow and selfish viewpoint of individuals. As before mentioned, pharmacy and medicine have lost caste because of the narrowness and selfishness of the professions themselves, and the only way to restore public confidence in physicians, pharmacists, and medicines is for the professions to unite with the legitimate pharmaceutical and chemical laboratories in an appeal to Congress for the proper legislation on this subject.

Mr. Bodemann, member of our Committee, calls attention to the fact that our present patent law as applied to materia medica, not only "does *not* encourage scientific research, but absolutely forbids it; that is to say, if you find a way to make a certain product and then patent it, I am not allowed to make the same product even though I may have discovered a better way for so doing."

This undoubtedly is true, and your chairman has since 1889 continually called attention to the fact in his reports, in literature, and in his reports as Chairman of this Committee, and Chairman of a Special Committee on National Legislation.

What shall be the character of this legislation? This is an important question, and apparently it will be very difficult to harmonize the conflicting interests involved. Several excellent suggestions have been made, one of the latest of which emanates from Joseph England, Secretary of Council of the American Pharmaceutical Association, and a member of the Committee on Patents and Trademarks. Mr. England suggested at the recent meeting of the Pennsylvania State Pharmaceutical Association, after listening to the report of the Committee on Patents and Trademarks, that said Association should appeal to Congress for the modification of the patent law, giving the Commissioner of Patents the right and authority to suspend or abrogate a product patent, or any materia medica product if an inventor of an improved process for its preparation shall apply for a patent therefor.

The effect of this plan would be quite similar to the effect of the clause in the German patent law which places the burden of proof in cases of infringement of process patents upon the inventor of the alleged improvement, forcing him to show that his process is in fact an improvement upon the original process for the preparation of the drug in question.

The question of trademarks is largely a question of interpretation of law. Trademarks used to distinguish between brands of well-known articles of commerce, each provided with a name of its own for proper classification and use in medical and pharmaceutical literature, is to be strongly commended. But the scheme for creating a monopoly by registering as a trademark a coined name and afterwards using it, not as a brand mark, but as the name of the article itself, is to be strongly condemned. Any person has a perfect right to make and sell any article of commerce provided he knows how to do so, also to deal in it under its currently used name. If it were true that the first commercial introducer of an invention acquires thereby a proprietary right in the product, or in the name of the product, there would be no necessity of a patent law granting him the right to the exclusive use of his invention, for he would already possess such a right by nature, and the laws would be so formulated as to protect him in his natural right. Moreover, the right to the exclusive use of the invention would be perpetual in character, and in its enforcement powerful monopolies would be created, unlimited in time and possessing privileges far more influential than any granted by the patent law. If the world had started in this way every art would now be subjected to monopoly and inventors would own the world; the rest of us would be their slaves.

The trademark law does not recognize any such scheme as the one described. In fact, the trademark law does not attempt to define what is meant by a trademark. This has caused much misunderstanding on the part of the Patent Office and the courts. Not many years ago one of the leading members of the Illinois Bar, in defending a case before the Supreme Court of the United States, asked the court for a definition of the trademark. He said: "I have searched the literature on this subject for a definition and found none," and he requested the court "for the sake of the Bar, the Bench, and the commercial interests of the country to define the word, trademark." The court did not respond to this appeal.

Fortunately many of the recent decisions of the Supreme Court have cleared up

mooted points in relation to the patent and trademark systems. In 1895 the Supreme Court decided that the names of patented products could not hold as trademarks after the patents expire. This was decided in the Singer Sewing Machine case. More recently the Supreme Court decided that the patentee has no right to dictate as to what article should be used in connection with his patented article. This was decided in the Mimeograph case, and referred to in our report last year. Still more recently the Supreme Court decided that the patentee has no right to dictate the price at which his patented product shall be sold by the purchasers. This was decided in the Sanatogen case, Bauer et Cie, of Berlin, Germany, co-partners, being the signers of Letters Patent of the United States, dated April 5th, 1898, No. 601995, covering a certain water-soluble albuminoid known as "Sanatogen."

Finally as to the names of unpatented products, there has been a large number of decisions to the effect that the name of an article does not belong to the person who christens it, but to the article itself as a common noun. Any person has a right to make an article, has a right to manufacture and deal in it under its currently used name. It is to be hoped that this question will come up before the Supreme Court in a clearly cut case when the court can decide this question once and for all.

Another point in this connection is that relating to the defense of trademarks. The courts require that persons desiring to defend their trademarks shall come into court "with clean hands." This they cannot do when they have been guilty of misstatements on labels or in literature relating to the products in question.

The Supreme Court of the United States in the case of Worden versus California Fig Syrup Company, threw the case out of court because the claims made by the manufacturers of the original product were not substantiated by the facts, and although the competing manufacturer used labels so closely imitating the original as to deceive the public, yet the defendant had no status in court and lost the case.

It is our desire as a committee to impress upon the profession the necessity of conforming our methods as pharmacists and manufacturers of materia medica products with professional and scientific requirements, so that we may receive the endorsement and co-operation of the medical profession. While it is true that a large number of physicians are utterly indifferent on the subject, and do not care what course is pursued by the pharmaceutical profession and manufacturers, yet, medical scientists are quick to draw the line between the altruistic work of the medical profession and the commercial methods of those engaged in the materia-medica-supply business. One of the reasons why the medical profession is indifferent to the course pursued by pharmacists and manufacturers is because they consider us outside the pale of professional life, and therefore it is a matter of indifference to them what course we pursue. Let the physician patent his therapeutic inventions or surgical instruments and he is ostracized by the fraternity because he has violated the principles of fraternity and professionalism upon which medical practice is founded. But it is not expected by them that persons engaged in commerce will conduct their vocations in harmony with the beneficence and liberality which is supposed to characterize the medical

profession. If we wish to secure professional recognition we can only do so by becoming professional men.

The medical profession does not consider it contrary to professional usages for medical authors to associate themselves with publishing houses for the publication of copyrighted books, and it is probably true that there would be no objections to physicians associating themselves with pharmacists and manufacturers for the production of materia medica products protected by process patents and brand names provided the products themselves and their proper distinction or currently used names are left free for introduction to science by the way of the educational channels of the profession. But we cannot expect endorsement for any plan whereby the products themselves and their names are commercially controlled and the educational machinery of the profession converted into a great advertising bureau for the exploitation of alleged new remedies by advertising.

To Recapitulate: 1st. That products and names of products should be free so that the products themselves as to their course or genesis, physical and chemical properties, methods of preparation, preservation, compounding and dispensing, and methods of applying them in the treatment of the sick may be impartially discussed in the medical journals, societies and colleges without forcing those who discuss them to advertise any one's special make of products. This will protect the educational machinery of medicine and pharmacy and secure the co-operation of the medical and pharmaceutical professions in the introduction of the products to science, thereby popularizing them without expense to the manufacturers.

2nd. Brands of products and the names of the brands should be commercially controlled by the manufacturer; that the advertising should be directed to creating a demand for the brands; that the manufacturers or commercial introducers who spend their good money in advertising may be protected in their investments.

3rd. Advertisers should be forced to tell the truth in their advertising and not permitted to create a fictitious demand by misleading statements, thus injuring their competitors by acts of unfair competition in trade.

In conclusion, we wish to again call attention to the suggestions several times made in previous reports of this committee, and the Committee on National Legislation, regarding the advisability of establishing some kind of Board of Control representing the medical and pharmaceutical professions and manufacturers engaged in the legitimate pharmacal and chemical industries, the same to work in co-operation with the universities, medical schools and colleges, government laboratories, and Patent Office for the proper introduction of materia medica products to science and brands of the same to commerce, and the proper application of the patent and trademark laws to materia medica commerce.

One of the first subjects for such a Board of Control to take up would be that of materia medica nomenclature for the purpose of making rules to be adopted by the manufacturers who affiliate themselves with the Board. The rule in regard to nomenclature should be one to protect the manufacturers by having the Board coin generic names for each product manufactured under the censorship of the Board, thus protecting the commercial interests of the manufacturers and

introducers on the one hand, and materia medica science and the practitioners of the medical and pharmacal arts on the other.

The suggestions of Mr. Frank H. Freericks, of our committee, should also be considered. He recommends a conference between representatives from the different pharmaceutical associations similar to the National Drug Trade Conference which has been held with reference to Federal narcotic legislation. In order to bring such a conference about, or to have the matter considered by the existing National Drug Trade Conference, it was suggested by Mr. Freericks that the A. Ph. A. upon the recommendation of this committee, vote on the subject.

The special subjects offered for discussion are as follows:

1st. The suggestion that the A. Ph. A. memorialize Congress by asking for a repeal of that portion of the patent law which permits the patenting of materia medica products, or substances used in the treatment of the sick.

2nd. The compromise suggested by Mr. England regarding the suspension of product patents by the Commissioner when improved processes are devised for their production.

3rd. The advisability of establishing some kind of a Board of Control representing the medical and pharmaceutical professions, manufacturers, medical and pharmaceutical colleges, the press, and government laboratories for the adoption of proper rules in relation to the introduction of materia medica products to science and brands of the same to commerce; said Board of Control to work in co-operation with the Patent Office in an advisory capacity.

4th. An expression of the Association in regard to the proper application of the patent and trademark laws in relation to materia medica inventions.

5th. The suggestion of Mr. Freericks in regard to a special conference or consideration by the existing National Drug Trade Conference.

Respectfully submitted by the Committee:

S. L. HILTON,
W. BODEMANN,
F. H. FREERICKS,
J. W. ENGLAND,
F. E. STEWART, M. D., Chairman.

Section on Practical Pharmacy and Dispensing

Papers Presented at the Sixty-First Annual Convention

SOME ADDITIONAL SOURCES OF ERROR IN THE CHEMICAL EXAMINATION OF URINE.

JOSEPH L. MAYER, NEW YORK.

At the 1907 meeting of the Association I read a paper, "Some Sources of Error in the Chemical Examination of Urine" (Proc., 1907, page 486) in which attention was called to various factors which if not observed would lead to faulty findings in connection with analyses of urine; since that time other sources of error have presented themselves which are of sufficient importance to be offered now.

In testing for sugar Fehling's Solution has the disadvantage that too large an amount of urine is employed with the consequence that foreign substances very frequently interfere, therefore Haines' Solution which only employs 8 or 10 drops of urine is suggested to overcome this difficulty, but as I pointed out in another paper, (Merck's Report, June, 1905), this solution is not stable, but deposits red oxide of copper on standing without the presence of urine and for that reason it is not of much value.

Recently Benedict, (Druggists' Circular from Jour. Amer. Med. Ass'n, January, 1912), has suggested the use of a solution in which 8 drops of urine are employed and the keeping qualities of the solution are such that it will keep indefinitely.

The solution and urine must be heated a minute or two to obtain the best results, a reaction only being regarded as positive when the greenish tinge extends throughout the whole mixture. A test tube is very unsatisfactory to perform the test in, therefore I employ a very small Erlenmeyer flask into which 5 cc. of Benedict's solution is measured with a pipette, and then 8 drops of urine added from a medicine dropper and the whole placed on the hot plate, and when the material starts to boil it is timed for 1½ minutes and then poured into a small test tube and allowed to cool spontaneously. It is a good plan to place a small funnel in the neck of the Erlenmeyer flask to act as a reflex condenser and prevent undue evaporation.

Where the quantity of sugar is large the presence of sugar is indicated at once by the green color whereas a small quantity of sugar is only revealed when the solution cools. If the mixture remains blue, sugar is absent.

For the quantitative estimation of sugar, Benedict's solution for quantitative work gives excellent results if properly employed. Benedict directs measuring the reagent into a porcelain evaporating dish, adding sodium carbonate, powdered pumice stone or talcum and boiling over a free flame.

This procedure did not yield very good results and I therefore altered it as follows:

Into a 100 cc. Erlenmeyer flask, with cord wrapped around the neck to prevent burning the fingers, measure with a pipette 25 cc. of Benedict's quantitative solution, add about 10 gram anhydrous sodium carbonate, a couple of pieces of pumice stone which have been heated to white heat and plunged into water, and about 10 cc. distilled water and place the whole on a hot plate until the solution boils and the sodium carbonate is dissolved, then begin adding the urine in small amounts from a burette, allowing sufficient time between each addition for the reaction to proceed, the end being indicated by the disappearance of the last trace of blue. As in the qualitative test it is a good plan to place a small funnel in the neck of the Erlenmeyer flask.

The use of the hot plate which I suggested in a paper read before the N. Y. S. Ph. Ass'n (Proc. N. Y. S. Ph. Ass'n, 1911, page 261) enables the qualitative and quantitative determinations to be carried out without any source of error.

Purdy's test for albumin using three-fourths of a test tube full of filtered urine, adding 1/6 of the volume of saturated solution of sodium chloride, acidifying with acetic acid and heating the upper inch of the mixture is a very sensitive and trustworthy one, but care must be exercised to keep the tubes very clean for when they are in use some time the portion of the tube which is constantly heated assumes a milky appearance with the result that albumin is indicated where none should appear.

Testing for acetone by adding solution of sodium nitroprusside to the urine acidifying with glacial acetic acid and overlaying with ammonia water is a very good test, but if the urine contains phenolphthalein there will be produced a coloration very much the same as when acetone is present.

In testing for indican by adding hydrochloric acid and an oxidizing agent, it is well to remember that after large doses of codeine a purple-red color is frequently produced which may obscure the blue color. In addition, if the urine contains iodine, the chloroform portion of the test will be colored carmine and it becomes necessary to add solution of sodium thiosulphate to decolorize it when the blue color will be plainly seen, if present.

In testing for diacetic acid the fact must not be overlooked that it is very volatile and that tests must not be made after the sample is a day old. The test is made by adding ferric chloride solution to the sample when the phosphates are all precipitated; further addition of the reagent produces a deep reddish-brown color which also appears if salicylic acid, phenol, acetic acid and other substances, produced after taking various other drugs are present.

A better test is Lipliawsky's modification of the Arnold reaction, which according to Wood (Wood's Chemical and Microscopical Diagnosis, page 553) is carried out as follows:

Two solutions are kept in stock. One is a 1% aqueous solution of para-amido-acetophenon with 2 cc. of strong hydrochloric acid in each 100 cc. of the mixture; the other is a 1% solution of potassium nitrite. To apply the test take 6 cc. of the first solution, 3 cc. of the second solution and 9 cc. of the urine to be tested. Add a drop of strong ammonia and then shake the whole thor-

oughly when a brick red color will appear. Ten drops to 2 cc. of the mixture of urine and reagent are then removed to another tube and 20 cc. of strong hydrochloric acid and 4 drops ferric chloride solution added, together with 3 cc. of chloroform. The corked test tube is then slowly tilted from side to side so as not to emulsify the chloroform. At the end of a minute, if diacetic acid is present, the chloroform will assume a violet color. In normal urines the color will be either a yellow or pale red. Salicylic acid and similar drugs do not interfere with the reaction.

In testing for bile with tincture iodine, the test to be successful must be made with a tincture of iodine diluted with alcohol until the color is a dark yellow which is applied by using a dropper to form a layer of reagent over the urine. A green ring indicates a positive reaction. Antipyrine yields the same reaction.

A better test is to take some of the suspected sample, add enough U. S. P. magnesia mixture to produce a precipitate and filter. When the material has filtered through, place the paper containing the precipitate on a white porcelain surface and add to it a drop of yellow nitric acid. A green color indicates bile.

These few notes like those published before are not intended as a course of instruction in uranalysis, but simply to point out some sources of error in the chemical examination of urine.

DISCUSSION.

Otto Raubenheimer, of Brooklyn, said he wished to call attention to two points in connection with this paper. One was, that Benedict's solution was not at all a new one. An attempt had been made to introduce Benedict's solution in the U. S. P., but it was declined with thanks.

R. H. Needham, of Ft. Worth, Tex., said that a good many authorities claimed that Haines' solution would keep indefinitely. His experience had not shown this to be true. Benedict's solution he had used for quite a while, and his experience had been that it kept well for two years. The last he had was four ounces in a five-pint bottle, which seemed to be just as sensitive at the end of that time as at the time he made it up.

CAMPHORATED OIL IN AMPOULES, SIMPLE APPARATUS FOR FILLING.

J. LEON LASCOFF, NEW YORK.

In 1909 Mr. Caswell A. Mayo read a very interesting paper before the New York Branch of the Association entitled: "Ampoules and Their Use in the Preservation of Sterile Solutions," in which he explained how easily the dispensing pharmacist can put up any sterile solution in ampoule form.

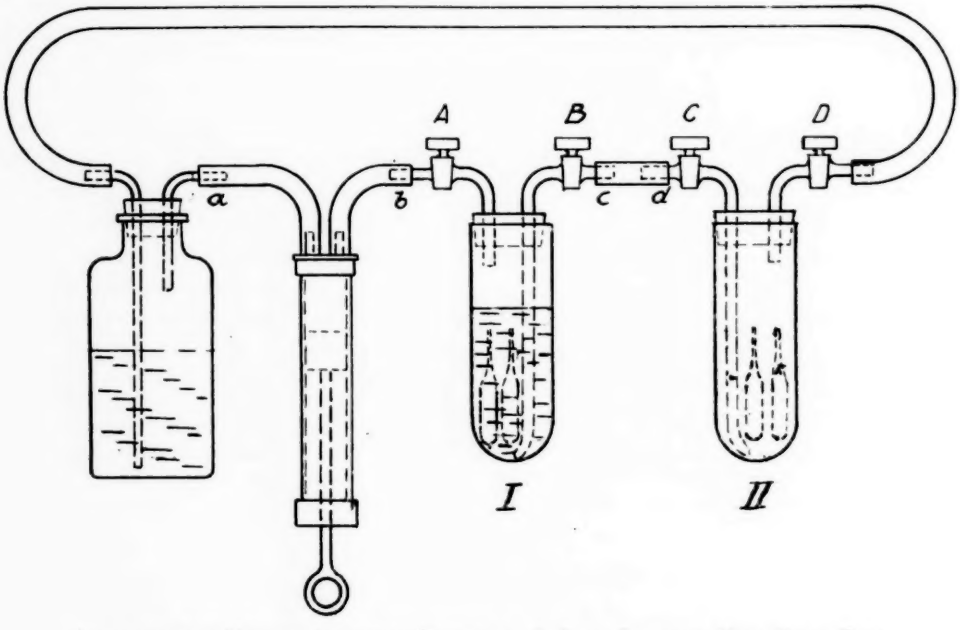
I was very much interested in this subject, and began experimenting, with the result that I met with marked success.

My object in selecting the subject of Camphorated Oil Ampoules, is that during my experience as a pharmacist I have had more calls for Camphorated Oil Ampoules than any other kind. In former years, when physicians prescribed camphorated oil for hypodermic use they had to be prepared extemporaneously,

which took a great deal of time and they were not always sterile. As such solutions are needed in emergency cases, the idea of making ampoules in sterilized form is far superior to the old way of preparing fresh ones every time they are required.

At the time my experiments began I had great difficulty in obtaining the empty ampoules, as they were not yet stocked generally in the United States. If the dispenser is only ordinarily skilled in glass blowing, he can make them himself from test tubes.

The chief consideration which I have had in mind was to devise a simple, non-expensive and practical method of filling glass ampoules with sterile camphorated oil. Sterile, because they are used by the physician in the hypodermic syringe and this had to be done without the use of too much heat as the camphor volatil-



APPARATUS FOR FILLING AMPOULES DEVISED BY J. LEON LASCOFF, NEW YORK CITY.

ized, so I devised the apparatus shown in the illustration. A single apparatus for making one dozen only may be used, but in cases where more than that number is required, a double apparatus may be used as shown in the diagram. It works very satisfactorily and in all cases the ampoules prove to be sterile, as I have in my possession the case reports in which they were dispensed. No infection has resulted from their use, either on the skin or in the deeper tissues. That the strength of the camphor was uniformly up to the standard has been testified to by the physician who prescribed and used them.

Having covered the technical side of the question, let us now turn to the commercial. We frequently see the statement made in print that professional pharmacy does not pay; that there is no money in prescription work. Let us take this particular preparation, ampoules of camphorated oil, and see whether they

have paid me or not. The permanent investment for the small outfit consists of the following:

SMALL OUTFIT.

1 Electric hot plate	$5.00
1 Sterilizing oven, costing	1.98
(Cake box, 80c; insulating cover, 75c.)	
(Fixing interior shelf, 25c.)	
1 Test tube, 4x 2	.50
1 Ginger ale holder	.25
1 Perforated rubber stopper	.35
2 Bent glass tubes with ground glass stop cocks	2.40
Rubber tubing	.20
1 Metal syringe	2.25
Total permanent investment	$12.93

LARGE OUTFIT.

1 Wash bottle	$0.25
2 Bent glass tubes	.20
1 Rubber stopper	.15
2 Glass cups, 2 x 5	1.00
2 Rubber stoppers, No. 11	.70
4 Glass tubes with stop-cocks	4.40
Rubber tubing	.40
Electric heater	5.00
Sterilizer	1.98
2 Ginger ale holders	.50
Air pumps	2.50
	$17.08

By using a Bunsen burner for sterilization instead of an electric stove and by using one instead of two glass stop-cocks, this can be cut almost a half, making the permanent investment $5.53.

The cost of the ingredients for a 2 cc. ampoule of camphorated oil, and the ampoules amount to a little less than 15 cents a dozen. I had one prescription for six ampoules for which I charged 90 cents. This was refilled forty-one times, making the receipts $36.90 from this one prescription alone. Another prescription called for twelve ampoules. For this I charged $1.25. It was called for 150 times, making $187.50 received from this prescription. The two prescriptions therefore brought in a total of $224.40. From this deduct permanent investment of $17.08 and the cost of the materials for 170-1/2 dozen at 15 cents a dozen, $12.75, and we have a net profit of $224.40—$29.83=$194.57, plus the apparatus. On an average the dispensing of the prescriptions required not more than 15 minutes of actual working time or a total of 191×15=47-3/5 hours. Allowing a dollar an hour as fair compensation for prescription work this leaves $194.57—$47.60=$146.97 profit above the cost of investment, material and labor. I do not think that commercial pharmacy can make any such showing on any of its investments.

DISCUSSION.

C. A. Mayo, of New York, said that he had been very much interested in the subject of ampoules since it was first brought up before the New York Branch, and had presented quite a complete paper before the Association at Los Angeles, at the 1909 meeting. It had afforded him great pleasure to observe Mr. Lascoff's apparatus in his store. Not only did he see him

fill one of these prescriptions, but he had brought out the account, and he had figured out himself how much money he had gotten on two prescriptions. He had been impressed with the thought that this was one of the best answers to the statement that professional pharmacy did not pay—that on these two prescriptions alone a profit of over $100 had been made. Mr. Mayo said it had afforded him great pleasure to testify to this particular phase of the matter. This work had been done in a rather small store, in a remodeled residence on a corner. The prescription room only measured some 12 by 15 feet, had no elaborate marble-tops in it, but was one of the most complete and neatest and cleanest places he had been in for a long time; and it had done his heart good to see a "real pharmacist." It was not only important that the pharmacist should make money, but he should know whether he was making it or not, and how he made it, if he did make it. The system of accounting in this case was so accurate and readily comprehended that one could find out in five minutes how this man had made his money.

H. A. B. Dunning, of Baltimore, said that a very simple process in use in his establishment for making camphorated ampoules was to simply fill the ampoule by the use of a subcutaneous syringe, seal the ampoules and place in an Arnold Sterilizer, sterilizing the ampoules and contents at the same time. Being sealed, no camphor could be lost. His apparatus only cost 75 cents.

LOTIO ALBA.

OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

The prescription calls for Lotio Alba. In this age of white dress, white flag, white cross, white linen, white plague, white slavery and whitewashing, undoubtedly White Lotion, or White Wash, will be of interest to the pharmacist. However, he is at a loss as he is unable to find a formula for this preparation, even if he is equipped with a good sized pharmaceutical library. No pharmacopœia, no National Formulary, no other formulary, and no dispensatory, *the* book which is looked upon to give all kinds of pharmaceutical information, mentions Lotio Alba. Even such authorities as Remington, Caspari, Arny, Fenner, Hager, Dietrich, Buchheister, Hell, Dorvault, Orosi, MacEwan, Martindale and others, and such standard works as the British Pharmaceutical Codex, and the Pharmaceutical Journal Formulary do not mention Lotio Alba.

Upon getting in touch with the physician the pharmacist is informed that this preparation is used largely in hospital and dispensary practice. If the pharmacist is fortunate enough to possess a hospital formulary, as for instance, that of Bellevue and Allied Hospitals in New York City, then he at last finds a formula for Lotio Alba, or White Wash, which is composed of zinc oxide, solution of lead subacetate, glycerin and lime water. This however, is not the preparation which the physician intends to be used against acne, pimples, blackheads or other skin affections. Lotio Alba is composed of zinc sulphate, sulphurated potassa and water, or rose water.

The writer, as chairman of the Committee on the A. Ph. A. Recipe Book, is well aware of the fact how difficult it is to find a formula for Lotio Alba. It

is for this reason that in the July number of the Journal of the A. Ph. A., 1912, page 761, he has published the following formula:

LOTIO ALBA
White Lotion
Lotio Sulphurata

Zinc sulphate	5 gm.
Sulphurated potassa	5 gm.
Water, or Rose water, a sufficient quantity to make	125 cc.

Dissolve each chemical in 60 cc. of water, or rose water, which latter is preferred by some dermatologists and also by some patients on account of its odor. Filter each solution and mix by slowly pouring the potassa solution into the zinc solution, then add sufficient water or rose water to make 125 cc.

If the pharmacist is a member of the A. Ph. A. and keeps or binds the Journal of the A. Ph. A., or if he is a reader of The Practical Druggist, he can find this formula in the Journal, as said before, or in The Practical Druggist for November, 1912, page 44. This prescription originally came from France and was introduced into the U. S. around the 70's and has been used extensively since, in fact its use in dermatology seems to be on the increase.

Potassa Sulphurata, Sulphurated Potassa or "Liver of Sulphur" was official in U. S. P. 1890, and must have been of some importance at that time, as it was admitted into the Appendix of the N. F. III, page 226, together with a formula for its preparation. There is a great difference in this substance in its physical characteristics, as well as its chemical composition. As can be seen from the specimens exhibited it varies from a dark liver-brown color to dark yellow, dark green, light green or even gray. When fresh it has a strong characteristic hydrogen sulphide odor which, however, upon exposure gradually decreases so that old "liver of sulphur" does not resemble liver or sulphur, being practically odorless and worthless. Owing to its rapid deterioration, it is absolutely necessary to keep it in well stoppered bottles, which is one of the specifications in the monograph of the National Formulary. Chemically, sulphurated potassa is a mixture of potassium trisulphide, K_2S_3, and potassium thiosulphate, $K_2S_2O_3$. Sulphurated potassa when prepared according to the N. F. should be almost completely soluble in two parts of water. On account of the importance of this chemical and inasmuch as it will be readmitted into the U. S. P. IX, no doubt some one, if not the writer, will give us a paper on the history and chemistry of potassa sulphurata.

The value of White Lotion depends upon the strength of sulphurated potassa. If the latter is fresh and contains the proper amount of potassium polysulphides, then the solution of zinc sulphate will be decomposed into zinc sulphide, which is a white precipitate and which is desired by the prescribing physician and which is of value in the treatment of acne, etc.

Prescriptions calling for 2 oz. of Lotio Alba, containing 1 dram of each chemical, have been compounded in different pharmacies in New York, Brooklyn and elsewhere and samples of same are herewith submitted. For better comparison these specimens are put in uniform bottles.

The color of these lotions varies from a pure white to gray or brown, some of them being so dark so as to deserve the title "Black Lotion." As to the precipitate this ranges from a very coarse to a very fine texture. Some precipitates are very dense, others are very bulky. In fact one sample is colorless like water, evidently having been filtered in order to improve (?) its appearance! This wide variation most certainly deserves the careful attention which pharmacists must pay to the preparation of Lotio Alba.

In the formula for Lotio Alba given above the writer has taken the pains to specify the proper manipulation. The following should be borne in mind:

I. The zinc sulphate solution should be filtered, if necessary.

II. The potassa sulphurata employed must be fresh and must possess a strong H_2S odor.

III. It is absolutely necessary to filter the sulphurated potassa solution, to remove any insoluble portion, which would act as an irritant to an inflamed skin.

IV. In order to obtain a finely divided precipitate it is necessary to have both solutions as much diluted as possible.

V. According to the experience of the writer and other prominent pharmacists it is best to *slowly* pour the potassa solution with constant agitation into the zinc solution. By this method a more bulky precipitate is obtained, which is the desideratum of the prescriber.

VI. The lotion should be dispensed with a "shake well" label.

As stated above, the author, as chairman of the Committee of the A. Ph. A. Recipe Book has proposed a formula containing 5 gm. each of zinc sulphate and sulphurated potassa in 125 cc. of water. Dermatologists all over the country prescribe this lotion in different strengths, generally varying from 1 to 2 drams of each chemical in 4 oz. of water or rose water.

Sulphurated potassa is a mixture of polysulphides, potassium thiosulphate and potassium sulphate. The best variety, that is one which has not been overheated, contains potassium trisulphide. According to its approximate molecular weight, 354.23 gm. of sulphurated potassa contains 169.21 gm. K_2S_3 and 185.02 gm. $K_2S_2O_3$. In the preparation of Lotio Alba the following change takes place.

$$\underset{285.41}{ZnSO_4.7H_2O} + \underset{169.61}{K_2S_3} = ZnS + S_2 + K_2SO_4 + 7H_2O$$

From this chemical equation it can readily be seen that in Lotio Alba, containing equal parts of the chemicals, all of the sulphuret is decomposed, in fact that there is an excess of zinc sulphate. This accounts for the fact that there is no odor of hydrogen sulphide in the finished lotion if properly prepared. The precipitated sulphur is, of course, in a finely divided state, just what is desired by the dermatologist.

As explained above sulphurated potassa is very unstable. What is the average pharmacist going to do when he receives an occasional prescription for Lotio Alba? There are two ways to overcome this difficulty.

I. Preparing small quantities of sulphurated potassa by the pharmacist himself. Although this might seem an odoriferous manipulation, it can easily be accomplished, especially under a flue or in the open air, and the writer himself has done so on numerous occasions with but very little trouble.

II. The preparation of a solution of fresh sulphurated potassa in water. Strange to say, *the solution* of this unstable chemical *is very stable* and the writer takes pleasure in exhibiting specimens which are one and two years old respectively. The chemical is almost completely soluble in two parts of water, but for convenience the author is in the habit of keeping in stock a solution four volumes of which represents one part of potassa sulphurata. The preparation and keeping of such a stock solution for the quick and proper preparation of Lotio Alba has been kept quite a secret, a so-called professional secret, by the pharmacists who are favored with the prescriptions of dermatologists. The writer, who believes in the motto, "To give and take pharmaceutical knowledge," takes pleasure in herewith presenting this "secret" method for the benefit of his brother pharmacists.

DISCUSSION.

In reply to a question by Mr. Fennell, as to whether, in these dark preparations, the zinc sulphate contained any iron, Mr. Raubenheimer replied that the black color was probably due to the presence of ferrous sulphide. The sulphurated potassa contained iron due to the fact that the manufacturer made it on a large and cheap scale. He merely melted his potassium carbonate and sulphur together and poured it out into an iron tray, and it would be noticed in one of the samples passed around that it was yellow on one side, and on the other side was black. Without filtering the solution, a gray precipitate would be had. He had filtered it, with the result as shown.

H. A. B. Dunning, of Baltimore, said that in his establishment they used much the same method as Mr. Raubenheimer had outlined for preparing solution of sulphurated potash. To insure the strength of the sulphide solution, they selected that portion of the sulphide which was yellow. He had found it necessary to keep the substance tightly stoppered, otherwise there was more or less change in the condition of the sulphide. It seemed remarkable that there were in the United States, in any of the cities from which these samples came, concerns that would send out such products as were to be seen on the table before the members. He thought it was not expressing it in language too strong to say that it was a disgrace that this should be true.

Mr. Raubenheimer stated that these samples came from all parts of the country, some from New York, some from Brooklyn, and some from Philadelphia; but none had come from Baltimore, nor had any come from Cincinnati.

A PRESCRIPTION AND A QUERY.

A. W. BENDER, DETROIT.

The following prescription was compounded by a local pharmacist:

℞ Atropinae sulphat ..... .004
Argenti nitrat 1
Bismuth subnitrat ..... 5.
Magnesii oxid ..... 5.
M. et div. in pulv. No. XV.
Sig.—One powder after meals and one an hour later.

During the first day six powders were taken according to directions and no ill effects were experienced. On the second day after having taken two powders in the morning, the patient began to feel dizzy and noticed that the pupils of his eyes were greatly dilated. An overdose of atropine was suspected and he stopped

taking the powders, but during the remainder of that day found it very difficult to read or to use his eyes in any way.

The following day the prescription was compounded in this laboratory using an analytical balance, sensitive to 1/600 grain, to weigh out the ingredients. After resting a day the ill effects experienced from the powders put up by the local pharmacist had entirely passed away and the patient began taking the new powders. He took them for a week according to directions and they caused no ill effects.

The difference in the action of the powders led to an investigation. Mr. W. M. Jenkins of this laboratory, who is thoroughly familiar with alkaloidal assays, analyzed the powders and found 1/100 grain Atropine Sulphate in each powder instead of approximately 1/250 grain which the prescription called for. This showed that the patient was getting the maximum dose of atropine sulphate instead of the prescribed minimum dose.

The facts in the case were presented to the pharmacist and inquiry was made as to the method used in compounding the prescription. It was found that he had weighed 1/16 grain atropine sulphate on a Torsion balance and had rubbed it up with the other ingredients. He stated that it had always been his practice to weigh out such small amounts on this balance and he believed it to be sensitive to this amount. After a short discussion he decided that thereafter he would use Dispensary Tablets or Tablet Triturates, in a prescription of this kind.

What is the correct way to compound this prescription providing there is no analytical balance at hand? Ought a pharmacist to have an analytical balance?

SCIENTIFIC LABORATORY, PARKE, DAVIS & Co., Detroit, Mich.

DISCUSSION.

G. F. Payne, of Atlanta, said he had occasion to use the prescription balance a great deal, as he had found it out of the question to use the analytical balance in many cases. It was too delicate, and had to be adjusted each time it was used. To weigh out whatever quantity the balance was accurate for, and then divide it very carefully by the eye, would be found to be a very accurate method when done properly.

C. T. P. Fennell, of Cincinnati, thought there was no trouble with the balances on the market, but where pharmacists did make a great mistake was, that they would shove their balances around from one place to another, and did not keep them properly leveled.

W. C. Alpers, of New York, thought the analytical balance should not be used in the drug store, as it required too much adjusting. It took a great deal of experience to weigh accurately upon it, and it was not expected of the average pharmacist that he should have the deftness to be able to handle it.

I. A. Becker, of Chicago, said he would like to bear testimony to the various weighings that could be made on a scale by not having it perfectly level. He had found that the ordinary box prescription scale, not furnished with a leveling device, would not do on the prescription counter, as its sensibility was very much affected by its being out of level.

NECESSARY APPARATUS IN A RETAIL PHARMACY.

JEANNOT HOSTMANN, HOBOKEN, N. J.

The subject of this paper has been discussed so often from its many sides in recent years, that it may seem a wasted effort to spend any further time in bringing it before this Association.

Agreeable to Mr. Lascoff's request, I will limit myself as much as possible to the chemical side of the question, he having made this suggestion knowing that I spent fifteen years in the retail drug business previous to my connection with the Department of Chemistry of the New York College of Pharmacy.

Having had considerable experience in testing and assaying prescriptions that had been compounded in New York City and Newark, as well as ordinary everyday counter samples, the writer believes that, although there exists, and always will exist, many cases of wilful adulteration and sophistication, that many a pharmacist who is hauled over the coals by Boards of Pharmacy, Health, Food Commissioners, and newspapers, is guilty only so far in that he has been lacking in giving the proper care to the kind of drugs he is purchasing as well as neglecting absolutely to convince himself that what he purchases is really up to the official requirements. It may seem very radical to suggest that every pharmacy should have as an adjunct to an up to date Prescription Department, a complete set of chemical apparatus, such as is necessary to perform the simpler tests and assay methods of the U. S. P., but the writer can see no other way in which the real pharmacist can protect himself from unnecessary trouble and expense except by not only making such installation as well as employing it faithfully and continuously.

It may be easier to buy from responsible firms and simply take their guarantee as being all that is required but this, at the best, is risky. Only recently, the writer in using some hydrogen peroxide sold by a firm possessing the highest reputation, discovered that it contained a considerable amount of barium; in another case, a sample of alcohol, labeled U. S. P. not only responded very vigorously to the aldehyde test, but also contained 10.5% of water. These examples prove conclusively that it is imperative that the pharmacist must protect himself and the only way he can do this is by being in a position to make the simpler tests himself.

The initial expense will not be very large, and will repay the owner many times in a short space of time.

I take it for granted that every pharmacy ought to be equipped with a real prescription balance in good order as well as accurate weights and graduates. The lack of these is the cause of much trouble. Impossible as it may seem, many pharmacists in a penny-wise-pound-foolish policy, purchase cheaply, never regarding quality. I have come across weights as much as 15% out of the way, and graduates run still worse. This is uncalled for as standard graduates can now be secured at very reasonable prices.

The above are necessary parts of a prescription department and as far as the

necessary chemical utensils are concerned, they will not take up very much space nor will the cost be prohibitive. I will mention a few that I consider absolutely necessary:

A rack of test tubes, a bunsen burner, a small assortment of beaker glasses and evaporating dishes, a water bath, some separatory funnels of various sizes, two burettes, a small assortment of pipettes, a set of metric weights from one milligram up and a balance sensitive thereto, test paper as well as the indicators employed in official methods. The U. S. P. list of reagents is very complete and the majority require no more than usual care in their preparation; for the making of volumetric solutions a few measuring flasks are absolutely needed. The majority of the reagents are fairly stable and if made up in small quantities, the more or less unstable ones will last the required time if conscientiously used. Of course, if they are prepared and placed upon the shelf and not made use of, they will naturally deteriorate and become useless.

With some glass tubing of various bores, a file, a cork-borer and some rubber stoppers, many pieces of apparatus can be prepared in short time and with little expense. An assortment of chemical flasks of various sizes is as necessary from a pharmaceutical as a chemical standpoint. A few crucibles—porcelain is adapted for most work—are also necessary as well as supports for same. A microscope magnifying to at least 350 or 500 diameters I consider absolutely essential, not so much for chemical as for pharmacognostical purposes.

Some few small glass funnels and small filters, particularly some of the quantitative kind, should be at hand.

The determination of specific gravity of many substances is of such very great importance that the necessary apparatus must be at hand. The principal one of course is the pycnometer or specific gravity bottle.

The specific gravity and solubility of substances being determined at certain stated temperatures, one or two accurate chemical thermometers must be at the worker's disposal.

I think that the above list covers the most important and needed pieces of apparatus although undoubtedly some have been forgotten.

Considering the time spent in getting the methods of tests of identity and for impurity and strength, as well as the assay methods for galenicals, given in the Pharmacopœia in such splendid working shape specially adapted to the pharmacist and also considering the high class and thorough education received by students in the better class of colleges of pharmacy to-day fitting him particularly for such work, it seems almost a crime that so few pharmacists are making proper use of the knowledge at their disposal in such a way that could not but raise their professional standing as well as increase the financial returns of their business.

In view of the fact that there is a continuous discussion being carried on as to whether pharmacy is going backward or forward, it appears to the writer, that there are many pharmacists scattered throughout our country who are making not only an enviable, country-wide reputation, but also getting large monetary returns from the professional side of pharmacy as practiced by them as real pharmacists, principally by employing the highly scientific knowledge at the disposal of every pharmacist who chooses to make use of it.

The writer's ideas will probably be regarded by many as radical, but he thinks that in the very near future it will become necessary to compel the pharmacist to have the proper chemical apparatus essential to carrying out the tests and assays mentioned above, just as it is now compulsory by law in certain states, that every pharmacy possess a U. S. P. and N. F. When this time arrives and the pharmacists perform the necessary work, we will hear much less about saturated solutions being deficient in strength, and many other cases now quoted, showing or trying to show the offending pharmacist as a law breaker and offender, in many cases unknowingly, will disappear.

COLUMBIA UNIVERSITY COLLEGE OF PHARMACY, August 15, 1913.

DISCUSSION.

Otto Raubenheimer said it seemed a pity that, after a pharmacist had received his training in a college, and in chemical and analytical work, he should forget all about it, and should not any more handle burettes or pipettes, but devote himself to the commercial end of the business. How much more profitable it was to devote a little time in the store to the professional study of the business, and do a little analytical work, especially as, when once commenced, he would come to like it. Another object, after the wholesaler once came to know that the pharmacist kept track of him, he would send him the best he had. He would not advise anyone to keep his chemical apparatus in the back of the store, but it should be kept in front.

F. W. Nitardy, of Denver, said his experience had been that, whereas the jobbers did not at first carry such things as U. S. P. alcohol, turpentine and linseed oil, they were now obtainable, as the result of shipping back a few things not of standard quality.

SELLING AN ANTISEPTIC.

Every household ought to have a harmless antiseptic on hand for emergency use, and every druggist ought to have the same on sale as a leader and business builder. In this day of wide information, everybody knows about germs, and a great many people believe in being prepared. These people will buy your antiseptic without any urging on your part. All you have to do is to put the stuff on display. Other people may be easily educated into keeping an antiseptic constantly on hand. If they don't know, teach them. You are doing them a good turn and building business for yourself.

A POUND OF PREVENTION
MAY BE WORTH A TON OF CURE.

Such is the sign one enterprising druggist has posted over a pyramid of pound bottles containing a harmless and popular antiseptic. His reading matter explains how an antiseptic applied in time renders a cut or wound aseptic, hastens the process of healing, may prevent lockjaw, and so on. This simple arrangement increased his sales over 500 percent. This is the way to build business. Help the community, and at the same time build business for yourself.—W. S. Adkins in *The National Druggist.*

Papers Presented to Local Branches

EFFICIENCY IN THE DRUG STORE.*

A. K. LOBECK, PHILADELPHIA.

The word efficiency comes from the same Latin root from which the word *effect* is derived, a root meaning *to make* or *to do*. The accepted definition of the words efficient or efficiency comprises the causing of *effects* or the producing of *results*. Let us hold on to this idea so that as we proceed deeper into the subject we will have something to which we can return when we go astray.

The owner of a drug store, to be efficient has two ends to accomplish. He must serve his customers with the best goods for the lowest prices possible, and he must make money for himself.

When we focus our eyes on the proprietor of a store we discover several factors with which he has to deal. Reduced to simplicity these are the factors: himself, as a personality; his clerks and other help; his stock in trade, store and utensils; and finally his customers. The efficiency of his whole business depends on how he controls these four factors, i. e., how he manages himself, his help, his stock, and his customers.

Himself. The proprietor of a business must be *interested* in it. That sounds like a very commonplace remark but, unfortunately, there is reason for it, for there are too many listless, uninterested men in business to-day.

When a proprietor feels that his interest is waning, there is nothing in the world will wake him up or invigorate him so much as an attempt to study his business with the view of making it more efficient. Of course it seems very illogical to expect a man who has fallen into such despondent and sluggish condition, which borders on despair, to turn in a moment and take the supreme interest in things which a study into efficiency demands. But, just the same, that is exactly what I say should occur. It is like a religious revival. And there is a psychological reason for it too. Professor James, the great psychologist, has said that it is indispensable, when a person is going to break off a bad habit, that he should adopt a new one in the most vigorous way possible, so as to destroy the old channels of thought.

The reason I bring up the question of the proprietor first is because I am sure that if the proprietor is not vitally, enthusiastically, and constructively interested in his business the end sought for will not be reached.

The Help. Shall we class the help with the cash register, the soda fountain, the mortars and pestles and the bottles on the shelves? Isn't the help part of the machinery of the store? You start at the suggestion but I am quite con-

* Read before the Philadelphia Branch, January, 1914.

vinced that every one of you is so classifying help in actual practice. You rent your store for so much a month; the interest on your investment for stock and fixtures is so much a month; you pay your clerk so much a month; apparently there is no difference. When I urge now that a clerk, and even a janitor, should be paid a regular salary and then a bonus depending on profits, many of you will say that it is all very well with some stores but not with yours. Do you know that that is just the cry that everybody puts up when improvements are suggested? We all think that the principles of scientific management are all very good in the case of other people but that we are an exception, or that we have peculiar conditions which have to be overcome some other way.

Another reason why we are unwilling to pay a clerk a bonus on the profits of the store is, not because we are stingy, but because we do not know what the profits are. We have no basis upon which to figure a bonus.

This plan is not proposed in order that the clerk will receive more money, but that he will know his income depends upon the success of the business, so that his whole attitude toward the business will be changed. Instead of being classed with the stock in trade and the machinery of the store, he joins hands with the proprietor as an active co-worker. It is a change in his attitude of mind which is greatly to be desired.

Then there is something else about the help which is even more important than how he is paid, and that is, what his responsibilities are. Every man in the store should know definitely where his duties begin and where they end. There should be an understanding so that everyone can work in unison. Unless there is an exact division of labor some things are certain to be neglected and the proprietor usually blames such neglect upon the nearest clerk. When there is a proper distribution of the responsibility, it does not mean that one man can not do another man's work when necessary, but it means that there is a basis for discipline. One man says, "Discipline is the keynote for the highest efficiency. Have each man's duties mapped out for him." No matter how small the establishment, this is vital.

The Stock in Hand, i. e., the Machinery of the Business. One of the most important parts of the machinery of the business is the money. The money that goes in and out of the business stands on just the same plane as the drugs and medicines which go in and out of the business. The money that is on hand stands on the same plane as the drugs which are on hand. The only difference between the two is that money is a universal medium of exchange while the drugs are not. It is handier to have money than it is to have a stock of drugs. But money is really quite in the same category with all other commodities. This is a basic economic principle.

The point, then, is that the druggist has a certain stock of business machinery on hand, among which is money. This business machinery he has to handle, manage and care for in various ways. In general these things all have to be cared for in the same way, as for instance keeping records of the amounts on hand, and keeping safely what is on hand, but specifically different methods are used to attain these ends.

Money being the most important of these commodities, simply because it is a universal medium of exchange and on account of this fact being the *meter* by

which the business man knows whether his business is producing results or not, it is essential that its records be kept with the greatest care.

This is ordinarily done by a device known as bookkeeping. Bookkeeping may be exceedingly complex or very simple, depending on the facts which are desired and the nature of the business. The ultimate fact which the druggist desires to know is what the net profit on his business is for a given period of time. But while this one fact is being learned a great many facts in the form of by-products may be produced. Some of these, for instance, are:

1. Amount of profit or loss every month on a given line of goods.
2. Percent of profit or loss on the investment for the different lines of goods showing which is really the most profitable.
3. Proportionate cost of handling different lines of goods based on rent of floor space, etc.
4. Distribution of the sales throughout the season, week, or day, giving a basis for the employment and relief of help.
5. Record of purchases of various lines of stock, giving data which will show whether it pays to buy in quantity or not.

Have you ever heard the expression that "a druggist can not see farther than the cash register"? I have that statement from an efficiency expert who has that belief because he knows very well that many of them are quite satisfied if they know what comes in each day and what goes out each day or simply if they know whether they are gaining or not.

Isn't it true that there are some proprietors whose pockets are simply an extension of the cash register drawer? The man who fails to appreciate the fact that his business is an organic entity which deserves to have an account by itself, is the kind of a man who doesn't know whether he is making money or not, and there are many of these.

There is another reason why the druggist should keep a rather accurate account of things. Every day the druggist is in business means so much valuable experience for him. And he is paying for this experience too. Should he fail to make it useful to him by not keeping a record of what is happening? The principle is the same as the case of a salesman who is on the road for a large firm. Everything he does he has to record, and all of these records are sent back to the home office to be sorted over, arranged and systematized to form the backbone for the firm's policy.

It may seem to be out of the question for the druggist to engage in a detailed system of bookkeeping. However, this is what he should do, and this is about the minimum.

He should have:

1. A columnar cash book in a handy place all the time in which are entered each day, from the cash register slips, on the left-hand side in the proper column the receipts from each line of goods, and on the right-hand side, in suitable columns, the amounts paid for salaries, for supplies, for each line of goods separately, and for miscellaneous and petty expenses.

Very little effort is needed to keep the cash slips entered up to date. The principle of the operation consists simply in sorting out the income into several incomes, and in sorting out the amount which is paid, into the several accounts corresponding to the incomes.

In a store doing more or less of a merchandise business the columns on the left side of the cash book would be something as follows: Proprietaries, Drugs, Cigars, Candies, Stationery, Prescriptions, etc. On the right hand side of the book would be similar columns so that when the columns on the right are totaled and subtracted from the totals of the respective columns on the left plus the inventories, the differences will equal the profit on the different lines of goods, from which should finally be deducted the right proportion of the overhead charges such as rent, to obtain the net profits.

Whether there are several cash registers in the store, whether there is only one with several keys, or whether there are none, this system of cash book can be readily adapted to the business. Moreover, as the business changes and new lines of goods are taken up or old ones subdivided, new columns can be added.

2. A second book which the druggist needs is his check book. When he makes out checks, he transfers the amounts from the stubs to the proper columns on the right-hand side of the cash book. When he deposits cash on hand in the bank he makes no record in the cash book, whatever, but he keeps a record in the check book. However, before he deposits a check which comes in he must be sure to record it properly in the appropriate column on the left side of the cash book. The difference between the listed deposits in the check book and the checks drawn equals the bank balance. The difference between the two sides of the cash book (when the left exceeds the right) equals the cash balance. The difference between the cash balance and the bank balance equals the cash on hand in the cash drawer.

At intervals the bank pass book should be balanced at the bank and the check book should be reconciled to it. Thus the indicated bank balance in the check book plus the amounts of checks not returned by the bank equals the bank balance shown in the bank pass book.

3. When the store does a credit business a third book is needed. This is the ledger of accounts of customers. The simplest and most effective form of this which I have seen, is handled as follows:

When an account prescription is filled the prescription blank is stamped with a numbering machine and placed on a file. In the same way when a credit customer gets other articles in the store, a charge record is made out on a simple pad, this being kept usually in the cash register drawer (or it can be written directly upon the bill with the duplicate sheet beneath). Every week or so the prescriptions and charge slips are entered on bills. The bill head is made in a duplicate form which is folded over so that a carbon paper may be placed between the two sheets. With the typewriter the various items are entered upon the bill, the prescriptions by number only. The lower sheet which is therefore an exact duplicate of the bill, forms a page for a loose leaf ledger. When the upper sheet is sent as a bill to the customer the lower sheet is torn off and inserted in the ledger. When the bill is paid it is stamped so, and at the same time the corresponding page in the ledger is so stamped. Moreover, when a bill is paid the various amounts are entered in the left side of the cash book in their proper columns.

These three books constitute all the bookkeeping necessary but there is an additional device which is important. It is an order book. The order book is kept in a definite and convenient place. As soon as it is noted that an article is needed it is entered upon the book in the first column. There are several other columns so that when the article is ordered, opposite the original entry in the other columns, are entered the initial of the firm, the date, the quantity ordered, price, etc. Then, when the goods arrive, they may be checked.

When the bills come in from the wholesale houses, they can be checked either from the goods or from the order books already checked. The bills until paid should then be kept together in a folder with memoranda of all other items which require payment for which bills may not come to hand. This folder represents then the liabilities of the firm, in the same way that the account ledger represents the resources, and these two lists should be taken into consideration when profits and losses are being figured. When the bills are paid they are removed from this folder and the various items making up the bill are distributed in the proper columns on the right side of the cash book.

While some of these phases of the accounting may seem complex, it is all really simple and very readily done without consuming much time and with a very small chance of error. Practically all of the desired facts are readily available when wanted, profits on any line of goods can be figured in a very short space of time, and the cash account is always in a form so that it can be checked with both the cash drawer and the bank balance.

A good feature of such a system is that as much as possible is kept in the original entry.

This concludes that part of our discussion which has to do with the taking care of the money. The next problem is the taking care of the other commodities in the store, and in the handling of these commodities. Let us go to the prescription counter first. The following are some of the things that have to be taken care of here and arranged so that they can be found readily: poisons, chemicals, proprietary chemicals, tablets, tinctures, pills, clear and colored bottles, corks, vials, pill and powder boxes and other small containers, capsules and caps, all of varied sizes.

The poisons, chemicals, etc., should each have a special compartment and should be arranged alphabetically therein. There are certain difficulties in this connection and one of the greatest of these is the fact that these chemicals, etc., are kept in their original containers, and that these containers vary so in size and shape that a lot of shelf room would be wasted if a strict order were adhered to. This same difficulty arises in the stock room of every line of business and is overcome by the employment of the following principle: When there is a miscellaneous stock of various sizes which it is desired to keep in a uniform way it is necessary to divide the storage space into units which will accommodate the largest class of the articles to be stored and then subdivide the units to suit the sizes of the smaller articles as they are interspersed among the large ones. The particular device which suits the drug business looks like a filing cabinet, in which the compartments are of the same size and shape. When one of the compartments is pulled out and looked at from the side it is seen to have adjustable shelves running across it so that a large bottle can be storted with small ones and in a minimum of space. This device is supreme over all other methods and is almost indispensable where space is limited.

Very often some of these chemicals, etc., are bought in a rather large quantity and transferred to small shelf bottles to be kept in the cabinet while the main quantity is stored away. In such cases it is suggested that on the front of the cabinet where the contents are listed some distinguishing mark be placed after or before the word to indicate that there is a quantity of this in stock elsewhere.

Where the expense prohibits the installing of such a filing system and where an improvement over the ordinary cabinet is desired, a very effective cabinet is one which has double or even triple doors provided with shelves. The conservation of space by means of such a cabinet is remarkable. In such a cabinet the different doors are used, one for poisons, one or more for chemicals, etc.

In case the unit filing system is in use, lists of the contents are attached to the outside of each division, of course in alphabetical order, and each class of articles relegated to its own sections, this arrangement being designated by large conspicuous labels. When ordinary cabinets are used, the alphabetical order is preserved but it is frequently convenient to have in addition, in each cabinet, a little stock list indicating the exact location of stock on the shelves. In the best stores that I have visited this was done.

The bottles, corks, vials, pill boxes, etc., are conveniently stored in drawers, beneath the prescription counter, these being divided into suitable compartments. It is essential that these drawers be labeled conspicuously on the outside. Capsules, caps, etc., are usually placed in drawers, above the counter, which should be accurately labeled. At the end of the prescription counter nearest to the store, should be the typewriter and beneath the typewriter a drawer for labels and paste. Many little details in arrangement suggest themselves here but any man who is on the lookout for efficient methods will devise just as good ones for himself. For instance, the caps and corks are kept near this end of the counter. Just beneath the ball or box from which the red cord hangs which is used for tying up the caps, there is kept attached to the counter, a stout piece of cord which is wound around and pulled tightly on the cap just after placing it on the bottle, thus giving it a good permanent crease which it retains when the more delicate red cord is applied.

When a prescription is filled this is about the routine to be followed:

First. Hang the prescription in a clip right in front of the counter where the dispenser can see it all the time.

Second. Take from the shelves the bottles of chemicals, etc., needed for the prescription and stand them in line at the right of the center of the counter.

Third. Weigh out each ingredient in order and incorporate it in the prescription, at the same time placing each bottle, immediately after weighing, to the left of the scales together with the weights which were used. By placing the used bottles at the left, one is sure that the ingredients on the left are in the mixture and those on the right are not in the mixture.

Fourth. Upon the completion of the prescription, have the ingredients and their weights checked, preferably by another individual.

Fifth. Label the bottle and wrap it up.

Sixth. Return the bottles to their proper shelves. This is facilitated and mistakes avoided if each class of bottle is designated by a certain bright-colored sticker which is placed on every bottle of that class. For instance, every poison bottle might have a red sticker, every chemical bottle a green one, every tincture bottle a yellow one, etc.

Seventh. File the prescription away. The ordinary method, of course, is the wire file. This has many objections, but it has some decided advantages. The advantage this method has over pasting into a book, is that, not only is time saved, but memoranda can be made on the backs of prescriptions, which is often done. Then, of course, books take up more room. The method of

filing prescriptions in sliding drawers has the advantage of keeping them neater, but they are less available, it seems to me, and it takes up a little more room and is more expensive. The best stores I visited in several cases still retain the old style long wire file with one or two minor improvements, and I admit its superiority.

Eighth. Wash up the pestle and mortar, graduates and other dishes instead of standing them around in the sink.

In connection with the prescription counter it is almost essential to have a list of the usual customers of the store with addresses and a mark indicating C. O. D. or O. K. for charge, so that when the messenger delivers the articles he has at the same time instructions as to whether collections must be made. Usually back of the prescription counter, there is a shelf reserved for books such as Pharmacopœias and Dispensatories, and if space is available also for current pharmaceutical literature. There is also a definite place, either a drawer or shelf, for catalogues of wholesale houses. In one store I visited almost half the space on the prescription counter was filled with a pile of miscellaneous journals and pamphlets, many still unopened; this to the great discomfort of the clerk who was at that time filling a prescription.

The criterion which shows whether a store is well arranged or not is the time and trouble that is required of a new clerk to find the things he needs.

Inspection of the cellars of several stores developed much of interest. The cellar is usually the stock room, and the ideal stock room, as intimated before, is divided into uniform sized units, which are subdivided to meet necessary requirements. The advantage of this, as mentioned before, is that it enables one to adopt any method of arrangement he desires, regardless of the size of the articles. He can arrange proprietaries together, or all the products of one firm together, or he can divide the stock into classes and arrange each class alphabetically. The division into unit compartments lends itself to any method of subdivision. The compartments are numbered and a stock-index of the goods refers to the unit compartment only, so that slight variations and adjustments are always possible without spoiling the system. No store visited, utilized the possibilities of this arrangement to the fullest extent.

In most stores inspected, the cellar was dirty and the stock subject to more or less dust. A very simple contrivance to prevent this, now in only very limited use, was suggested to me by a student who found it more than satisfactory. It consists in placing rolling window shades in front of the stock shelves. One roller is placed near the ceiling, the shade rolling about half way to the floor, at which point another roller is placed reaching the remaining distance. At the edges of the shades are nailed strips of wood behind which the edge of the shade passes. This keeps the shade close up against the shelves, and prevents the entrance of dust.

As soon as goods come into stock it is well to price-mark them immediately, as they are unpacked, and at the same time the wholesaler's bill should be checked.

In the main part of the store a strict logical arrangement of things cannot always be adhered to because display is often essential. The usual arrangement is that which tends to keep articles most in demand near at hand, and in many cases already wrapped or put up in small packages. Patent medicines are classi-

fied, with cough syrups together, liniments together, and so on. Wrapping paper cut in several sizes and kept in handy compartments just under the counter, saves time during the busy part of the day, and the use of elastic bands to snap around small packages adds materially to the speed of serving customers, but, owing to expense, should be used only during rush hours.

A drawer of labels similar to those in the prescription room should be kept in the front store, also corks and bottles. Many stores have auxiliary devices to help the clerk. For instance a stamp-vending machine saves much annoyance and I have assurance that it pays for itself.

In a large store the general arrangement is important. For instance, the aisles between counters should be opposite each other to facilitate the movements of clerks.

The Customers.—The final problem which confronts the manager of a store is his relation to the public. In this is comprised advertising, window dressing, etc., the details of which will not be considered here.

In closing I will summarize:

First of all, the proprietor himself must be interested in maintaining a standard. He must keep himself keyed-up by visiting other stores, by meeting other men, and by reading periodicals relating to his business.

Second, the proprietor must organize the work of the store so that all employes know exactly the extent of their duties and for what things they are responsible, and he must see to it that all including himself, have suitable hours for rest and recreation.

Third, he must look after the machinery of his business, including money and stock in trade, with an eye to the conservation of movements and time. He must have suitable arrangements for perfect cleanliness and order.

Fourth, he must study his customers.

After this exposition some of you may be reminded of the incident at the War Department at Washington just prior to the Spanish-American War. For several years the whole system was pervaded with an inordinate desire to get things in the most systematic condition possible in preparation for that event, and perfection was almost realized in every branch of the organization. During the war one of the clerks was heard to remark, "Oh, dear, I had this office in such fine shape, and then along came the war and upset everything." Evidently he had the idea that the war was an unjustified interruption of the work of the War Department. It may occur to some of you that after the store is systematized a rush of customers will come and upset the whole system. Therefore as a final suggestion let me add—organize the store while it is in action, so that every new arrangement will be put to an immediate practical test.

I stop now with the remark of a student: "Efficiency saves time and money, and the spirit of efficiency is the knowledge that one has trained himself to do all things well. It is full of inspiration to any worker. Being armed with that spirit he does his daily work better and looks beyond his daily work to further and to greater things."

STANDARDIZATION OF VOLUMETRIC ACID AND ALKALI SOLUTIONS.*

JOSEPH L. MAYER.

The U. S. P. VIII recognizes but one substance for the standardization of volumetric acid and alkali solutions—potassium bitartrate. This salt after being purified, as per directions of the Pharmacopœia, is employed to standardize the alkali, which then serves to standardize the acid.

This method is a very good one and leaves little to be desired with reference to accuracy.

Notwithstanding this fact, we constantly hear complaints concerning the method, mainly due to the time and trouble necessary to properly prepare the bitartrate, with the result that many students and pharmacists are inclined to employ some other method of standardization.

To determine the relative accuracy of other commonly used methods as compared with the pharmacopœial one the following work was undertaken.

The Bitartrate Method was employed by following the directions on page 532 of U. S. P. VIII for the purification of the salt and the method for standardizing V.S. KOH on page 552.

The H_2SO_4 V.S. was standardized by measuring 25 cc. into a 100 cc. Erlenmeyer flask and titrating in boiling solution with the above KOH solution employing phenolphthalein indicator. The factor for the H_2SO_4V.S. was found to be 1.0391.

The Ammonium Sulphate method was carried out by accurately weighing 2 small beakers, adding 25 cc. of the H_2SO_4 V. S., an excess of redistilled ammonia water, evaporating to dryness on a water bath, then heating in an air oven at 110 C° for periods of 20 minutes until the weight became constant, when the weight of ammonium sulphate was calculated to sulphuric acid. To avoid contamination with silica, at the time of making the test, strong ammonia was placed in a test tube and the gas distilled into distilled water.

The factor for the H_2SO_4 V.S. was found to be 1.0385.

The Sodium Carbonate Method was carried out by employing Merck's reagent anhydrous sodium carbonate, heating in a platinum dish a few minutes, quickly transferring to a stoppered weighing bottle and after cooling weighing off a portion for analysis, which was dissolved in water and titrated against the V.S.H_2SO_4 using methyl orange indicator.

The factor for the H_2SO_4 V.S. was found to be 1.0409.

The Oxalic Acid Method was carried out by weighing off portions of Merck's reagent oxalic acid crystals, dissolving in water and titrating against the potassium hydrate solution, using phenolphthalein indicator.

This potassium hydrate solution was then employed to standardize the acid

*Read before the New York Branch of the A. Ph. A., April 13, 1914.

using 25 cc. of the latter, titrating in hot solution, employing phenolphthalein indicator.

The factor of the H_2SO_4 V.S. was found to be 1.0398.

The Silver Chloride Method was carried out by taking 25 cc. of HCl V.S., about 200 cc. distilled water, adding an excess of one drop of silver nitrate solution, heating to boiling, allowing to stand until granular and filtering and washing on Gooch Crucibles, which after drying on the hot plate were weighed. From the weight of silver chloride the quantity of HCl in the solution was calculated.

This V.S. HCl was then run against the KOH solution, titrating in hot solution and this KOH run against the V.S. H_2SO_4 in hot solution, phenolphthalein being the indicator employed.

The factor for the H_2SO_4 V.S. was found to be 1.0367.

The Barium Sulphate Method was carried out by precipitating the H_2SO_4 in 25 cc. quantities of the V.S. H_2SO_4, the barium chloride solution which was boiling being added from a pipette drop by drop, to the boiling H_2SO_4 solution which had been diluted with water.

The material was allowed to stand on the hot plate until the solution became clear and then filtered through Gooch Crucibles, which after being washed, dried and heated were weighed as barium sulphate from which the quantity of H_2SO_4 was calculated.

The factor for the H_2SO_4 V.S. was found to be 1.0440.

All the determinations were run in duplicate and yielded remarkably close checks.

The following table shows at a glance the results by the various methods:

Potassium Bitartrate Method (U. S. P. VIII)	Factor	1.0391
Ammonium Sulphate "	.....	1.0385
Sodium Carbonate "	.....	1.0409
Oxalic Acid "	.....	1.0398
Silver Chloride "	.....	1.0367
Barium Sulphate "	.....	1.0440

6 | 6.2390

1.0398

With the exception of the barium sulphate figure the results agree closely, but notwithstanding the fact that this is a trifle higher it has been included in making up the average to derive the factor.

Numerous determinations made on sulphuric acid solutions always yielded a higher result by this method than by others.

This sulphuric acid was originally standardized on June 4, 1912, and the factor which was the average of all the methods was 1.0388.

Considerable fungus growth being present in the solution the work detailed in this paper was begun and carried out on November 12, 1913, the factor which was the average of all the methods being as above noted 1.0398 the difference between the two figures after about 17 months being 1.0398—1.0388=.001, which proved that the age of the solution and the growth in it had not affected it.

As pointed out by Clark, (Proc. Amer. Pharm. Ass'n, 1910, page 978) a volu-

metric solution whose factor has not changed more than four points in the third decimal place in titrating 25 cc. of one solution against 25 cc. of another solution is regarded as not having changed its strength.

These results indicate that any of the above methods may be used with perfect safety for the standardization of volumetric acid and alkali solutions although our personal preference is for the ammonium sulphate, sodium carbonate, and potassium bitartrate methods.

I would take this opportunity to acknowledge my indebtedness to my assistant, Dr. I. Swartz, for his work in carrying out some of the duplicate determinations.

SOME FACTS AND DEMONSTRATIONS ON LLOYD'S REAGENT AND ALCRESTA ALKALOIDS.*

DR. GUSTAV REHFELD, ST. LOUIS.

I am very glad that you afforded me an opportunity to address you to-night and I hope to be able to interest you.

I feel that Lloyd's Reagent and the Alcresta Alkaloids will prove to be, in the near future, a matter of great importance in the fields of exact and applied sciences.

It has occurred many a time in the past, that apparently trifling circumstances were instrumental in revolutionizing the fields of human endeavor. Every one of you is familiar with the cause that gave the first impulse to the evolution of the laws of gravity, how the swinging of a candelabrum affected the science of physics, how an accidental arrangement of lenses fostered the invention of the telescope and the microscope, how the insignificant popping of the lid of a tea kettle brought about the wonderful development of steam power. It is unnecessary to enumerate any further; you know that most discoveries had their starting point in just such every day occurrences; millions and millions of times they happened and millions and millions of times they passed unrecognized until some one somewhere caught the revelation and thereby enriched human knowledge generally, opening up new view points and thus engraved his name indelibly on the pages of historical record.

I feel that the discovery of Dr. John Uri Lloyd is destined to do just such a thing, to change our viewpoints considerably, to make our knowledge more exact in a field that is not altogether easy of treatment and which will, thereby, benefit mankind generally, as it affects chemistry, medicine and pharmacy.

I wish to say to you though, that some time will elapse before the far reaching results, which we expect to get, will be realized. However, enough facts have been established to leave no doubt whatever, that this discovery will affect chemical research in alkaloids; that, already, it has given the medical profession a most valuable addition in materia medica, and to the pharmaceutical profession a means of rendering intensely bitter substances absolutely tasteless.

A few years ago Dr. John Uri Lloyd, of Cincinnati, discovered that a very

* Read before the St. Louis Branch, March 20, 1914.

common substance, aluminum silicate, in hydrated colloidal form, acted as an alkaloidal attractive. He investigated this phenomenon for a long time together with Dr. Waldbott, of Cincinnati, and about a year later Dr. Felter established the physiological action of its strychnine compound.

Some time after, Drs. Wiley, Wilbert and Kebler, all of Washington, D. C., were made acquainted with the alkaloidal energies of this substance, and toward the middle of 1913, Drs. Gordin and Fantus, of Chicago, contributed the first general papers on the subject. And this is about all that is known on this subject to date, as far as published reports are concerned.

Through the courtesy of Eli Lilly & Co., whom I have the honor to represent, I am enabled to-night to exhibit before you as a representative body of the St. Louis Branch of the A. Ph. A., the first samples of Lloyd's Reagent and a few Alcresta Alkaloids. These names were given to these products to individualize them, as standing in a class of their own. Your Branch is the first in the world to see and possess these preparations, as I have been permitted by Eli Lilly & Co. to present them at the end of my talk to the St. Louis College of Pharmacy.

Lloyd's Reagent, as stated before, is hydrous colloidal aluminum silicate. However, the various forms of natural aluminum silicate possess usually very slight alkaloidal affinities in their crude condition. In order to obtain uniform results, it became necessary to prepare it in a particular manner from a specially selected quality of natural hydrous aluminum silicate. Through the well directed efforts of our scientific department, we are enabled to-day, to supply Lloyd's Reagent of uniform attractive strength.

You will have noticed that I used the word attractive, where another word, reagent, would, apparently, have been more appropriate, but I did so, because our ideas of chemical reagents are pretty well established, and as Lloyd's Reagent acts electrically, it seemed the better word.

Lloyd's Reagent is practically insoluble in all liquids, and an excess is therefore inconsequential. Please bear this in mind when I shall demonstrate its energies before you to-night. When we add Lloyd's Reagent to a solution of alkaloidal salts, they are at once removed and held firmly in aluminum silicate combination. This holds true with the natural alkaloid compounds investigated to date; however, one exception should be noted and that is caffeine. It takes repeated treatment with Lloyd's Reagent to remove it from solutions, and this confirms our findings that caffeine is a feeble alkaloid. It certainly is feebly attracted by Lloyd's Reagent, and removed with difficulty, as I said before.

A very noteworthy feature of this Reagent is, that it has no affinity for other substances, especially those that are usually associated with alkaloids in plant-glucosides. It is, therefore, possible, as a matter of fact it has been successfully accomplished, to remove the alkaloids from fluidextracts without disturbing any of the other active or inert constituents as in the case of ergot. In order to facilitate the action of Lloyd's Reagent, the solutions should be acidulated.

As this reagent acts electrically, you will not be surprised to learn that the alkaloidal salts do not undergo any chemical change at all, in other words, quinine sulphate, morphine sulphate, strychnine sulphate, etc., will be removed as quinine sulphate, morphine, or strychnine sulphate as the case may be. But, note the remarkable phenomenon, that as long as these salts are in aluminum silicate

combination they are absolutely tasteless and not soluble in acid solutions any longer, while alkaline solutions destroy the electrical affinity gradually, and the alkaloids regain their bitter taste and previous solubility. This is of immense importance to internal medication. The Alcresta Alkaloids, being enteric, can be introduced into the system and directed to the very seat of the trouble without disturbing the functions of the stomach. Think what this means, for instance, in the case of ipecac; in fact with all, when employed in the treatment of intestinal disorders. The great usefulness of Alcresta Alkaloids becomes at once apparent, does it not? You readily will understand also, that these preparations are not intended nor destined to replace the old form of alkaloids, as both will have large fields of usefulness in therapeutics.

The affinities of Lloyd's Reagent for the different alkaloids vary greatly, as can be seen from the limited number of alkaloidal solutions investigated and listed; for instance, to precipitate:

1 Gram Cocaine hydrochlorate requires about 10 grams of Reagent.
1 Gram Cinchonine sulphate requires about 10 grams of Reagent.
1 Gram Cinchonidine sulphate requires about 10 grams of Reagent.
1 Gram Brucine sulphate requires about 7 grams of Reagent.
1 Gram Morphine sulphate requires about 4 grams of Reagent.

A correct list of all alkaloids investigated, will, no doubt, be given to investigators interested, by Eli Lilly & Co., upon request.

With your kind permission, I shall now demonstrate to you the efficacy of Lloyd's Reagent on various alkaloidal salt solutions. In order to remove any doubt, as to the presence of the alkaloids in these solutions, I shall first prove their presence by Mayer's Reagent, and after removing them by means of Lloyd's Reagent, shall demonstrate their absence by Mayer's Reagent.

I have chosen for this demonstration solutions of berberine sulphate, morphine sulphate, quinine sulphate and strychnine sulphate, all of the same strength, that is 1 percent.

Now as far as the recovery of alkaloids is concerned from their aluminum silicate combination, it is easily accomplished by means of ammoniated chloroform. In most instances the alkaloids can be removed from the dry powder, but where the alkaloid does not yield readily, the addition of a little distilled water is sufficient to bring about the desired result.

It probably will not be amiss to express the hope that later investigations of Lloyd's Reagent will bring about abbreviated and reliable methods of assay. Unfortunately, I am not in a position to-night to say whether or not we shall be able to do so. But let us hope that some one may be successful to evolve a short and reliable method by means of it. It would be an achievement of considerable moment.

I would like to call your attention also, to another matter which occurs to me should be investigated since we became acquainted with the mysterious activities of Lloyd's Reagent, and, that is, our filtering media. We are using talcum powder, pumice stone, kieselguhr, and others to help clarification of pharmaceutical preparations containing active ingredients. You know now what would happen if you were to filter an elixir containing alkaloids through Fuller's earth.

It seems to be that the electrical energies of the different media should be investigated, as unusually brilliant and otherwise elegantly appearing liquids may be devoid of active constituents, after filtration. As long as we do not possess positive knowledge about the electrical character of those substances, it may be wise to use paper pulp.

In conclusion, I wish to say to you, that Dr. Lloyd, as well as Eli Lilly & Co. stand ready at all times to render all possible service to further earnest scientific investigation. All inquiries for experimental supplies should be made to Eli Lilly & Co., Indianapolis, Ind., where they will find prompt attention.

INDISPENSABLE INSURANCE FOR PHARMACISTS.*

FRANKLIN M. APPLE, PHAR. D., PHILADELPHIA.

History has shown that it is the practice of shrewd, hard-headed, far-thinking men to protect their most valued possessions by some form of insurance. The greater the possibilities that they will suffer a severe loss from destructive forces, the more the desire to protect themselves from these agencies, and to increase the amount of the protection.

Our government has always recognized the wisdom of protection against all forms of invading and destructive forces by establishing agencies to conserve the desirable assets, as well as to repel the destructive invaders.

Our Army and Navy are supported and maintained chiefly to ensure peace to the nation by moral influence, and our Federal Public Health Service is depended upon to protect us from injury from organisms that would greatly distress, if not annihilate us if permitted to carry on their destructive work unimpeded.

Within recent years the wisdom of calling a halt upon the wasteful methods of handling our natural resources has been more apparent, and has given rise to an era of greater conservation, for we must admit that we, in large measure, are guardians of these wonderfully rich possessions for posterity, as they have been handed down to us by our forefathers. This conservation is but another name for insurance against waste and extinction.

Before me, as I pen these lines, lies the advertisement of a large bonding and insurance company, in which is described a form of insurance for almost everything that has a monetary value—even re-insurance of other forms of insurance; but to the pharmacist the most vital form of insurance is not included in the long list of classes of risks, viz., insurance of Professional Pharmacy, the backbone and sinew of the profession.

The omission of this form of insurance is excusable, for it is impossible for any company to write this kind of policy. It can only be obtained by co-operative action of pharmacists in a society, founded upon principles recognized to be honorable, unselfish, uplifting, ethical and of mutual benefit to its members and to society generally.

Such a praiseworthy assemblage of men and women is exemplified by the oldest

* Read before the Philadelphia Branch, March, 1914.

of pharmaceutical associations—The American Pharmaceutical Association, which was organized in 1852, in this city.

Why should a pharmacist neglect to protect his dearest possession—his professionalism, that for which he labored diligently and for which he was educated by special courses of instruction?

In these days of commercial greed and encroachment upon the domain of others' fields of endeavor, our calling has not been protected from the efforts of barons of wealth, to drag our profession down to the level of ordinary bartering and trading, to the great detriment of those specially educated to prepare and dispense medicaments for the sick and dying members of society; and to the ultimate, lasting disadvantage of the public, who ofttimes fails to appreciate the benefits it is enjoying until they are lost to it.

In the effort to find some means to protect us against the dangers which threaten our rights and liberties as a distinct professional calling, it is imperative that each pharmacist should seriously consider the necessity of affiliating himself with the American Pharmaceutical Association, which has an unsullied record of constant vigilance for the interests of pharmacy and its votaries for more than sixty years.

Just as the "Minute Men" of '76 gave instant heed to the call to duty in defense of their rights and liberties so to-day it is imperative for every true and loyal pharmacist to gather under the banner of the A. Ph. A., enroll himself upon its muster-roll and fight in defense of his profession and his existence.

The marvelous word "Drugs" has been seized upon by parties possessed of wealth to serve as a cloak for conducting mercantile establishments that are the worst cases of mis-branding known to me, and as such, should be punished as those who mislabel their goods are penalized by the provisions of the Food and Drugs Act. It is only by concerted, strenuous, untiring effort that we can hope to resist and repel these forces.

Do not be asleep and awaken too late to protect yourselves, but join with us to-day to repel those who would destroy the good name and fame of professional pharmacy.

I have intentionally avoided saying anything concerning the premiums charged by the Association for this insurance. Practically speaking, it makes no charge for the many benefits its members enjoy.

The mere pittance, five dollars per year, charged for membership, which includes The Journal of the American Pharmaceutical Association, is a ridiculously low charge for the post-graduate course of instruction in pharmacy that comes to one by mail in convenient installments monthly, to say nothing of the handsome cloth-bound volume known as "The Year Book," and in these days of enlightenment and advancement no one can worthily call himself a pharmacist who does not keep himself abreast of the times.

To describe the lines of activity of the Pharmaceutical Association is to cover every phase of pharmacy, as its many sections indicate the wide scope of its work.

It is impossible to speak of an effort to uplift, advance or to protect pharmacy without quoting from its archives; hence no one engaged in the drug business can honestly say that he has not and is not benefitted by the efforts of his co-

workers, who have banded themselves together to protect pharmacy, under the respected and revered banner of the American Pharmaceutical Association.

The moral effect of a large membership is well known to all thinking men; hence if the effort of the present members and workers should be reinforced by your co-operation, even greater results could be obtained; therefore why delay doing your part to increase the effectiveness and stability of the protection you enjoy as a member of a respected profession.

Come, join our ranks and help to protect pharmacy against those who would destroy it.

Let me call your attention to the words of Lowell: "No man is born into the world whose work is not born with him; there is always work and tools to work withal; for those who will and blessed are the horny hands of toil."

THEORIES UNDERLYING THE USE OF ANTITOXINS AND VACCINES.*

A. PARKER HITCHENS, M. D., GLENOLDEN, PA.

The action of antitoxins has so definitely passed beyond the stage of pure speculation that I think there will be little difficulty in expounding the theories underlying their use. With regard to vaccines, likewise, we have come to describe more clearly their mode of action without the use of a terminology recognized only by the initiated few.

Out of studies in immunology—the science dealing with the mechanism of contagious diseases—have developed methods by which the body may be assisted either to prevent disease-producing germs from gaining a foothold, or to eliminate them after they have become established.

The disease-producing bacteria are classified in various ways according to their functions. For our present purpose, the classification of most interest is that which considers the bacteria according to their manner of causing disease. Thus we find that one group of bacteria produces definite, soluble, and diffusible poisons and that all the symptoms of the disease are dependent on the action of these poisons upon the tissues for which they have an affinity. The second group of bacteria, on the contrary, do not produce soluble and diffusible toxins in appreciable quantity—their effect is brought about by a much more complicated process. We believe the production of disease by this class of bacteria is not a function in which they alone participate, but is the result of their interaction with the body cells.

Belonging to the first class of bacteria, the only organisms of interest to us are the *diphtheria* bacillus and the *tetanus* bacillus. These produce soluble and diffusible poisons—*toxins;* and spontaneous recovery from these diseases depends upon the generation by the tissues of a substance which will neutralize the toxins —*anti*-toxins. The requisite antitoxins can be easily produced in animals and

*Read before the Philadelphia Branch, April 7, 1914.

transferred to the bodies of patients by administering the blood serum of the treated animals.

For obvious reasons, horses are generally selected for the production of antitoxin. The germs in question are developed upon a fluid artificial culture medium, veal broth. After the bacteria are removed from the full-grown culture, the sterile filtrate, containing the specific toxins, is injected subcutaneously into the horses. The horses react by the production of antitoxin. Enormous quantities of toxin are administered, and consequently enormous quantities of antitoxin are generated and stored in the blood serum of the animal. The antitoxins on the market then, consist of this blood serum either native or chemically treated so that the pseudo-globulin constituent of horse serum which carries with it the antitoxin principle is removed and furnished, in solution, in as pure a state as possible.

The strength of the antitoxin is determined by titrating it against toxin, the guinea pig being used as indicator. In defining a unit at present, there is no more reason to say that it is the amount that will neutralize 200 fatal guinea pig doses of a theoretically pure toxin, than there is, in defining an inch, to say that it has a definite relation to the circumference of the earth. Twelve inches make 1 foot, 36 inches 1 yard; 1000 units of diphtheria antitoxin constitute the immunizing dose, 5000 units the average initial curative dose; 1500 units is the official immunizing dose of tetanus antitoxin.

The action of diphtheria antitoxin may be clearly illustrated by imagining the disease to be due to a mineral acid generated within the body and poured into the circulation in constantly increasing quantities. According to the urgency of the case, let us inject a corresponding quantity of a harmless alkali. The acid is neutralized, the disease is controlled, and the fate of the patient now depends only upon the amount of damage done to the tissues before the alkali was administered.

In tetanus the case is slightly different. Tetanus toxin has a strong affinity for the nerve tissues, and the compound formed by this union cannot be split up by antitoxin. After symptoms of the disease have developed, there is but one hope in treating tetanus with antitoxin. If the treatment has begun before the lethal quantity of toxin has been fixed by the nervous tissue, and if the amount of antitoxin then administered be sufficient to neutralize the free toxin in the blood, there is a chance that recovery may ensue.

Bacterial Vaccines. For a clear understanding of the action of bacterial vaccines, it may be helpful to consider this subject from the standpoint of our knowledge of anaphylaxis. Anaphylaxis, in its derivation, means a lack of resistance—it is the opposite of prophylaxis. Richet, in his investigation of certain poisons derived from sea urchins, noted that an injection of these poisons into a dog, instead of rendering the animal immune to a second dose, actually made him more susceptible. The work of Rosenau and Anderson showed still more clearly the operation of this phenomenon.

Anaphylaxis concerns the effect of proteins or albuminous substances upon animals; it concerns *all* proteins whether they are poisonous in themselves or not; for instance, egg white and normal horse serum act precisely as the proteins of the plague bacillus or of the typhoid bacillus. And furthermore, the proteins of

dead bacteria act practically in the same way as the proteins of living bacteria. It must be remembered, however, that anaphylactic symptoms can be produced only by proteins foreign to the animal; that is, anaphylaxis cannot occur in a guinea pig from the repeated injection of guinea pig serum, nor can the symptoms be produced in a horse by the injection of horse serum.

If we inject a normal guinea pig with a dose of protein parenterally—that is, by any route except by the gastro-intestinal canal—it does not appear to suffer the slightest inconvenience. If, however, we inject this animal two or more weeks later, with the same protein, it will die within one or two minutes and with very definite symptoms accompanying death. This is a manifestation of anaphylaxis.

For an explanation of this phenomenon we must go back to the work of Prof. Victor V. Vaughan upon the chemistry of the protein molecule. Vaughan has shown that a protein, treated chemically according to his method, is split into two parts—the one poisonous, the other non-poisonous. The *poisonous* part obtained from all proteins is the same whether it results from the splitting of egg white or from the splitting of typhoid bacilli, the symptoms leading to death in the guinea pig are identical. This poisonous part then is a poison and has no other function nor effect; one dose has no bearing upon the effect of a subsequent dose, no hyper-susceptibility is produced, and no tolerance, even by repeated administration.

The *non-poisonous* part, on the other hand, is specific in its action. The non-poisonous part of typhoid bacillus protein will immunize an animal against typhoid infection, but not against infection with colon bacilli; the non-poisonous part of horse serum will sensitize a guinea pig to horse serum, but not to goat or sheep serum.

These results of Vaughan's work upon the chemistry of proteins suggest an explanation of the mechanism of anaphylaxis; they show us that instead of being the opposite of immunity, anaphylaxis is merely one of its manifestations; and furthermore they give us a clearer understanding of immunity itself.

When foreign proteins are injected into the tissues of an animal, the body cells at once set to work to remove this protein. They prepare a ferment capable of splitting the protein molecule, which possibly because of its size is not diffusible, into smaller fractions able to pass into the circulatory system and be thence eliminated. These fractions of the protein molecule are similar to those obtained by Vaughan in his chemical splitting; that is, a *poisonous* part which, after the first injection, is liberated slowly and is therefore harmless in its effect, and a *non-poisonous* specific part which stimulates the body cells to produce a specific ferment-like substance. About two weeks after injection, the protein has been entirely removed from the tissues, the poisonous part has been eliminated so gradually that no symptoms have resulted, and the non-poisonous part has stimulated the tissues to generate a large amount of specific protein-splitting ferment.

At this point we must pause to note that according to Vaughan, the protein-splitting ferment includes the anti-bodies so difficult to understand in the theories of the German and French schools of immunity. This theory of the American school does not contradict the fact established by Metchnikoff, and further eluci-

dated by Wright, that the white blood corpuscles play an active part in the removal of foreign proteins whether they be cells or fluids; nor is it out of harmony with the theory of Ehrlich, who gives to the group of anti-bodies—collectively the "ferment" by Vaughan—different names according to their functions.

The guinea pig, then, at the end of two weeks after the first injection of, let us say, horse serum, contains in his tissues no trace of horse serum; but he does have within his body a large quantity of protein-splitting ferment, which may remain in the tissues for a long time; and even if it disappears, the power to generate this ferment upon demand may remain permanently. If we now inject into this guinea pig a second dose of horse serum the proteins contained therein are at once attacked by the specific ferment; digestion occurs almost immediately, resulting in the liberation of a large quantity of the poisonous part of the protein molecule; the animal is overwhelmed by it and dies, usually in less than five minutes. A dose sufficiently large to cause death depends upon the method of injection; if injected into the circulation or into the brain 1/20 cc. is sufficient; if injected subcutaneously, however, at least 5 cc. is usually necessary.

Now as to the bearing of this phenomenon upon infectious disease—Vaughan has used typhoid fever as a typical illustration. Infection results from the entrance of a few typhoid bacilli into the tissues under circumstances which permit their growth and multiplication. There is normally present in the body a small amount of a non-specific protein-splitting ferment which attacks the typhoid bacilli, liberating the non-poisonous part which in turn begins to stimulate the tissues to the production of a specific anti-typhoid ferment. We know that in guinea pigs it takes from 8 to 14 days to produce enough ferment to cause serious symptoms of intoxication upon the injection of a second dose of the protein. Now this period corresponds exactly to the incubation period in typhoid fever. It is during this time that the typhoid protein-splitting ferment is produced in increasing quantities while the typhoid bacilli are rapidly growing in numbers. The ferment sets free the poisonous part in gradually increasing quantities with the appearance and progressive increase of fever and the other symptoms of the disease. This process continues up to the point where the number of typhoid bacilli destroyed each day equals the number reproduced in the lesion. This balance is maintained for a time until the number of bacilli destroyed exceeds those reproduced.

A patient recovered from typhoid fever, has remaining in his tissues a large amount of typhoid protein-splitting ferment, so that when typhoid bacilli again gain entrance to his tissues, they are at once attacked and destroyed before they have a chance to develop. Obviously there is no intoxication because the amount of typhoid proteins is infinitesimal compared to the amount necessary to result in anaphylactic shock.

It is now easy to understand the action of typhoid vaccine. When we inject beneath the skin a number of typhoid bacilli, their disintegration is started by the normal proteolytic ferments in the body. A second and third dose given at intervals of about 10 days increases the quantity of specific typhoid protein-splitting ferment. The theory of typhoid immunity by means of bacterial vaccines applies equally to the production of immunity to other infecting bacteria. The theory underlying the use of bacterial vaccines in disease is based on the

fact that the tissues affected are unable to produce a sufficient quantity of the specific ferment to overcome the infection. The injection of bacterial proteins in a healthy part of the body leads to the production there of these anti-bodies which are conveyed to the focus of infection through the circulatory system and thus assist the local cells.

It will now be clear that the requisites to success in vaccine therapy are, (1) that the vaccine injected must contain bacterial proteins identical in kind with those causing the infection; (2) that the ferment produced locally must come in contact with the infecting bacteria. For one with proper training it is not hard to determine the kind of bacteria causing an infection; nor is it hard to obtain either a stock vaccine representing these bacteria or to prepare an autogenous vaccine identical with them; and it is a very simple matter to inject these bacterial suspensions beneath the skin of the patient.

If the patient is not in the last stages of disease, there is not one chance in many thousands that his tissues will fail to produce the proper anti-bodies or ferments. If the patient shows no improvement as result of the treatment, it behooves the physician to use means by which the ferments may be induced to perform their function.

In some infections, as in staphylococcic infection, accessory measures are seldom needed, while in streptococcic infections they are nearly always necessary. In gonococcic infections of the urethra and prostate, the mere injection of vaccines accomplishes but little; in gonococcic infections of the joints, however, the vaccine is apparently sufficient.

We are indebted to Besredka of the Pasteur Institute in Paris for an improvement upon bacterial vaccines which constitutes a real advance in vaccine therapy. As said above, when the bacterial vaccine is injected beneath the skin a small quantity of the protein is split up by natural ferments and the specific non-poisonous part thus liberated stimulates the production of ferments which continue the disintegration until the maximum effect of the vaccine is obtained.

The ferment itself is composed of at least two constituents; one is specific and by Ehrlich has been called *amboceptor;* (the *opsonin* of Wright is a similar anti-body). This substance has the power of fixing itself to the bacteria, thus preparing them for digestion by another substance which is not specific but is always present in the blood of healthy animals, and because the latter completes the ferment action, it is called *Complement.* Besredka proposed that amboceptor be utilized to prepare the bacteria for the immediate action of the complement. Bacteria thus prepared for the action of the complement were said to be "sensitized" and the suspensions of such bacteria were called by him "sensitized vaccines." The advantage they have over ordinary bacterial suspensions is that they eliminate the period during which the specific ferment is being formed. "Sensitized vaccines" have already been used extensively in France and also to a certain extent in England. The published reports amply attest their superiority.

Anti-bacterial Serums. The so-called "therapeutic or anti-bacterial serums" include anti-streptococcic, anti-pneumococcic, and anti-meningococcic serums. These are prepared by the injection of horses, first with dead, and then with living bacteria. In the case of anti-meningococcic serum, injections of autolysed bacteria are alternated with the cocci themselves. The autolysate contains a toxic

substance which causes the production of some antitoxin. This serum, like anti-dysenteric serum, partakes therefore of the nature of both an anti-toxic and an anti-bacterial serum.

These serums depend for their activity upon substances called ferments by Vaughan, but according to the nomenclature of Ehrlich, "Anti-bodies;" that is, substances antagonistic to the bacteria. Used in sufficiently large doses, anti-bacterial serums have undoubtedly great value. The chief difficulty lies in the fact that no method has so far been found by which anti-bacterial serums can be produced comparable in potency with diphtheria antitoxin.

It is well known that a much larger dose of any curative serum must be used if it is injected subcutaneously than if injected intravenously. Realizing this fact and the relative weakness of anti-bacterial serums, there is but little doubt that their use intravenously will be resorted to in the future with increasing frequency.

Summary. 1. There are two classes of bacteria with regard to their method of producing disease: (a) those that produce soluble and diffusible toxins, and (b) those that do not.

2. The toxin-producing bacteria are the diphtheria bacillus and the tetanus bacillus.

3. Antitoxins, produced by injecting horses with the specific toxins, are antagonistic to the specific toxic products of the bacilli in a manner very similar to the antagonism between acid and alkali.

4. To the second class belong the great majority of the disease-producing bacteria.

5. The symptoms in the diseases caused by the latter, are probably the result of the action of their specific metabolic products, combined with the effect of the liberated poisonous part of their protein molecule.

6. Recovery from such infectious diseases depends upon the production of sufficient specific protein-splitting ferment to remove their causative bacteria from the tissues.

7. The amount of this specific protein-splitting ferment may be increased by injecting bacteria of the same kind beneath the healthy skin.

8. Immunity from infectious disease depends upon the existence in the tissues of sufficient specific protein-splitting ferment to dissolve invading bacteria before they have a chance to develop.

9. The rational administration of bacterial vaccines presupposes accurate diagnosis and the administration of bacteria identical in kind with those causing the infection. It depends furthermore upon the ability of ferments and antibodies to come in contact with the infecting bacteria.

10. "Sensitized vaccines" are superior to ordinary vaccines because they reduce the preliminary period during which the injected bacteria are being split up so that the non-poisonous part may be available for the production of specific anti-bodies.

11. Anti-bacterial serums—anti-streptococcic and anti-pneumococcic—depend for their activity upon their content in specific anti-bodies or ferments.

12. The amount of these ferments in even the best serums is relatively small and the serums must therefore be used in larger doses than has been customary in the past.

13. Anti-meningococcic serum is both anti-bacterial and antitoxic.

14. Since the efficiency of curative serums is increased many fold when administered intravenously, this route will be used more frequently than has been the custom in the past.

A CONSIDERATION OF AUTOGENOUS VACCINES.*

B. B. VINCENT LYON, M. D., PHILADELPHIA, PA., PATHOLOGIST TO METHODIST EPISCOPAL HOSPITAL; ASST. PATHOLOGIST TO GERMAN HOSPITAL.

Empiricism is dying. Throughout the last century and particularly its latter decades, the searchlight of truth has lighted up many of the heretofore dark places in the study and practice of medicine. The discovery of the causation of many diseases through bacterial agencies was epoch-making and led the way naturally toward the introduction of measures able to cope with such a foe.

During the last thirty years scores of men have been at work on this problem and have each added their little to the sum total of our present knowledge and from the time of Jenner one startling etiologic and therapeutic discovery has followed another, so that among the names destined to live will always be found those of Pasteur, Koch, Pfeiffer, Ehrlich, Behring, Wassermann, Nogouchi and others.

Bacteria are divided into two classes, the good and the bad—Saprophytic and Pathogenic. The Saprophytic bacteria are scavengers; they thrive best on dead tissues and assist in freeing the body of many waste products. Pathogenic bacteria thrive best on the living tissues of the host in whom they are capable of producing disease. Their pathogenic action is due to the liberation of the toxins they contain or the elaboration of poisons in the tissues of the host.

Of these bacterial toxins there are two main types: The Exo-toxins, contained in bacteria whose poisonous principles are capable of being dissolved out of the bacterial cell. To this class belong the Bacillus of Diphtheria and the Bacillus of Tetanus. The great majority of bacteria, however, produce Endo-toxins, or poisons which are incapable of separation from the cell bodies by any of our known filtration methods. Examples of this are the Bacillus of Typhoid Fever and the Streptococcic and Staphylococcic groups.

While bacteria are capable of producing disease it is not through their mere presence *per se,* for as we know, our persons in health permit of the culturization of numerous pathogenic bacteria, therefore, other factors must enter in and these factors comprise the natural defensive mechanism of the body against disease.

Natural Resistance: This varies greatly with the individual and has a certain selective action, for why is it that one person can harbor in his mouth virulent Pneumococci and Streptococci and yet can go through life without a single attack

*Read before the Philadelphia Branch, April 7, 1914.

of pneumonia and, conversely, be subject to repeated attacks of tonsillitis, whereas, another individual harboring the same organisms may have several attacks of pneumonia during his life time and none of tonsillitis. This is due to the development of what we call *immunity*, which is the power of resistance the body tissues are capable to exert against bacterial poisons. *Immunity* may be divided into *species* and *racial immunity*.

Species Immunity: It is well known that many animals are naturally immune to disease common to man and that it is only with the greatest experimental difficulties that infections with these diseases can be made successful.

Racial Immunity: Also among the different races of the same species there appears to be a natural immunity against certain diseases, which have long been prevalent in that particular section, and which when carried to another section where fresh soil is obtained immediately light up into virulent epidemics. This is seen in the ravages of tuberculosis among the Negroes and the American Indians, and it is seen conversely in the immunity from yellow fever that has long been enjoyed by the Negro.

Acquired immunity is the protection that is afforded an individual who has passed through an attack of one disease, this conferring a greater resistance to that disease in the future. This is commonly observed in diseases like typhoid and yellow fever. Acquired immunity may be either active or passive. The process of conferring protection by treatment with either an attenuated form or a sublethal quantity of the infectious agent of a disease or its products, is spoken of as "Active Immunization," because the immunized individuals gain their power of resistance by taking an active physiological part in the acquisition of this new property of "Immunity." Thus active immunity can be acquired by repeated injections of attenuated cultures, as in Pasteur's work in hog cholera; by injections of sublethal doses of virulent bacteria as demonstrated in the protozoon disease of Texas fever; by injections of killed bacteria, first suggested by Chauveau. This method of active immunization with gradually increasing doses of killed bacteria, has been carried out successfully against many bacterial diseases. It is particularly useful against those groups of bacteria producing Endo-toxins and finally by injections with bacterial products from poisons excreted or liberated from the bacterial cell body. These measures comprise *vaccination*.

Passive immunity, on the contrary, is that gained by the host through no active formation of anti-bodies on its own part, but rather accepting ready to hand the anti-bodies prepared by the tissues of another species. The most conspicuous types of this are the anti-diphtheritic and anti-tetanic sera. These are both designed to meet bacterial exo-toxins and it is this type of sera that is most successful. On the contrary anti-gonococcic, anti-streptococcic sera and the like, which depend for their activity on the lysin, opsonin and other anti-bodies they contain, are not blessed with a like therapeutic success. Allen states that "these sera are not always curative, indeed, their use during active disease may not be altogether free from danger. Thus the administration of anti-cholera or anti-typhoid serum, which each depend for their activity on the lysin they contain, may result in the extra-leucocytic lysis of so many bacteria that the resultant

flooding of the tissues with large quantities of their contained endotoxin may imperil the life of the recipient from the additional toxaemia."

Bacteria have a selective action, not only must they gain access to the body in large enough numbers and possessing sufficient virulence, but they must also gain entrance to a tissue that is suitable for their further development. For instance, you can rub a typhoid culture into an abraded surface of the arm or a culture of streptococci can be swallowed, both with equal impunity, but reversing the conditions a bacterial infection is sure to follow.

Now what are the general defenses of the body against this bacterial invasion? They are fourfold:

1. *Antitoxins,* or substances manufactured by the tissues which are capable of neutralizing the soluble toxins produced by certain groups of bacteria.

2. *Agglutinin,* a substance which causes bacteria free in the tissues of blood stream to be clumped together in masses and held nearly immovable and therefore more accessible for phagocytosis. This is the more conspicuous where it concerns the motile bacteria. Though originally observed in 1889 by Charrin and Rogers, in studying the Bac. Pyocyaneus, the agglutination reaction is commonly associated with Widal, who first applied the phenomenon in the diagnosis of disease by an unknown organism.

3. *Lysin,* a substance or substances elaborated by the body which has the property of dissolving certain bacteria. Pfeiffer noted that guinea pigs which had been immunized against cholera bacilli could withstand the intra-peritoneal injection of further virulent cultures without harm and found that the peritoneal fluids dissolved the organisms.

4. *Opsonin,* discovered and named by Wright, is a substance that prepares or sensitizes the bacteria for ingestion by the phagocytic elements of the white blood corpuscles.

There are two types of bacterial infection, local and general. The former is best represented by boils, the latter is seen in diseases like typhoid fever, pneumonia, puerperal sepsis and the like. When a person recovers from a bacterial disease like typhoid fever, it is by the body having gradually elaborated the foregoing anti-toxins, agglutinins, lysins and opsonins in amount sufficient to cause the neutralization, destruction and solution of the bacteria. The time required in the manufacture of these substances varies in different diseases, 21 to 28 days, as a rule, in typhoid fever; 9 to 11 days, as a rule, in pneumonia, etc. So we have two biologic methods of treatment, serum and vaccine treatment, and the principle of the former is to supply these protective substances ready made (passive immunity), and in vaccination to stimulate the tissues to reproduce them more quickly, and, in as much as diseased tissues are more sluggish, in locally manufacturing them, to utilize or exploit healthy tissues for the advantage of the enfeebled ones. This then is the scientific basis for the action of vaccines. And now what are vaccines?

Vaccines are emulsions of the bodies of dead bacteria killed in various ways and suspended in suitable dosage in a solution of normal saline.

There are two types of vaccines—heterogenous and autogenous. Heterogenous vaccines are prepared from infections similar to the case which is to be

treated, but from infected material not derived from the patient himself. This type of vaccine may be and usually is polyvalent; that is, cultures are obtained from several infections of the same nature, and therefore represent, possibly, several "strains" of the same organism. These heterogenous vaccines are commonly called "stock vaccines," perhaps, because they are prepared in quantities and held in readiness to be used in a given case on demand.

Autogenous vaccines are prepared from cultures grown from infected material and obtained from the patient himself. In other words they represent, and are specifically, the organism from the effects of which the patient is suffering and toward which you are assisting the patient to establish an immunity. Knowing these differences, it is not difficult to understand that biologists, bacteriologists, serologists and clinicians of the thinking type, are agreed that the autogenous group of vaccines fulfill best the scientific therapeutic requirements. Let me quote from an article recently published by a man whose authority is unquestioned: "With the exception of certain organisms, such as tubercle bacillus and the gonococcus, there is little reason for employing stock vaccines instead of autogenous, and there is abundant ground for believing that the use of stock vaccines will not only lead to carelessness of diagnosis and misinterpretation of the probable nature of the infection, with consequent administration of the wrong species, but will sometimes be directly harmful. I am well aware that the argument has been advanced that laboratories are not sufficiently available to practitioners in all sections to make it possible for them to obtain autogenous vaccines, and would reply that, in a measure, this may sometimes be true, but the general demand for stock vaccines has been artificially stimulated by manufacturers, and the practical application of this method of treatment has out-distanced the scientific investigation of its merits. Instead of wholesome growth with the gradual provisions of local agencies where autogenous vaccines could be obtained, an unwholesome growth of this mode of treatment has been stimulated and those who seek to keep up with the latest pronouncement of advertised literature find themselves in a position of dependence upon stock vaccines in many cases. There can be no doubt that in some instances stock vaccines are satisfactory. Staphylococcus and typhoid and tuberculosis vaccines are instances, but the other forms, and especially streptococcus and pneumococcus and mixed vaccines, are of very doubtful efficacy.

"Here we come upon the field or variability in the organisms themselves and unless a growth has been prepared from the patient himself, the strain may be entirely different and inappropriate. It avails little to use mixed strains which require the reduction of dosage of the one possibly present and available strain below the point of usefulness, because of the simultaneous injection of several other strains in the mixture, which are of no use, or practically useless.

"As for stock mixture of heterogenous organisms designed for the treatment of cases in which no sort of accurate bacteriological diagnosis has been made, too vigorous condemnation cannot be phrased."

In my own personal experience I have met with many cases referred to me by other practitioners, cases on whom various stock vaccines had been tried for various lengths of time, in various dosages, with absolutely no improvement, and which have responded with surprising promptness to an autogenous vaccine

and have established an immunity that in many cases has lasted for years, and I, personally, have used in some cases stock vaccines of differing types, giving them a thorough trial, only to become discouraged at their non-success, and have discarded them for autogenous vaccines, with gratifying results.

On the other hand, I believe that stock vaccines of a single or of a polyvalent single organism type have their place, and a very important place, of usefulness in the (46-69) hour interval that if often necessary to prepare the autogenous vaccine, after the bacterial identification in the specific case has been established, and I, almost uniformly, use this period to give one and sometimes two injections of the appropriate stock culture. Appropriate stock vaccines may also be used with advantage in association with autogenous vaccines in suitable cases.

A word or two now to ensure success in getting the proper bacterial results in culture taking:—The first principle is to obtain your material free from contamination, and this requires the observance of special precautions according to the kind of material that is to be cultured.

Urines: Should always be obtained by sterile catheter, after the external meatus has been properly cleansed, and drawn off into a sterilized flask or bottle to which no preservative is to be added. It is better to catheterize the day specimen into one receptacle and the night specimen into another.

Feces: Should be obtained urine free, and specimens from first and last portion of the stool obtained and studied.

Sputum: Should be obtained with greatest care, because for practical purposes no mouth is germ free, and alveolar pyorrhœa, infected tonsils and the like are so common. Before retiring, the mouth should be carefully rinsed with sterile water and the teeth brushed with a sterilized tooth-brush, and a closed vessel containing sterile water, placed at the bedside. In the morning, the mouth should again be rinsed thoroughly with the sterile water, gargled, and with the brush re-sterilized, by dipping in boiling water, the teeth should be thoroughly brushed, and then a few mouthfuls of clean sterile water should be swallowed. After this, the sputum should be expelled by coughing and caught in serial, sterilized, wide-mouth bottles (with sterile corks). It is best that only one or two masses of sputum should be expelled into any one bottle, and the bottles labeled and sent at once to the bacteriologist for immediate examination.

The sputum should, after direct examination of stained specimens to determine morphologically the different types that may be present, be then "whipped" through several petri dishes containing sterile water, to further free the bacteria from surface contamination, and the final washed specimen planted upon the different culture-media that appears best suited for their recovery in pure culture, as judged from the findings on the first direct examination.

Cultures taken from boils or from infected sinuses, from acne pustules, from tonsillar follicles, and the like, should be made only after thorough appropriate cleansing and disinfection of surface relations, and then taken from a second or third portion of the material, discarding the first, by means of a platinum wire or a sterile capillary glass pipette inserted well within the cavity.

Cultures from eye, ear or nose should be taken with appropriate measures to ensure success.

Blood specimens should always be obtained from a vein, preferably that at the bend of the elbow, by means of an all-glass sterilized syringe of a capacity of not less than 5 cc. It is rarely, if ever, necessary to cut down on a vein, but the arm should be thoroughly sterilized by tincture of green soap and water, by 5-10 per-cent lysol, by absolute alcohol and finally by ether—personally, I prefer not to use iodine. It is better to moderately tourniquet the upper arm before sterilizing in order to prevent thin-walled veins from collapsing under the pressure. The blood should be immediately plated and flasked in peptone and dextrosed-broth.

In pulmonary abscesses, in suitable cases material may be obtained by lung puncture in the following way:—after sterilizing the chest wall in the same manner as for blood cultures, the needle attached to an all-glass syringe containing 3 cc. of peptone broth should be plunged into the lung at the proper point, as determined beforehand by clinical means, and 1 cc. of the broth introduced and reaspirated as far as possible and tubed. This measure will yield results in many cases properly selected clinically.

After getting suspected infected material, direct examination by means of variously-stained slide specimens should be made to determine morphologically and by staining reactions and relations, whether one or more types of organisms are present and if the latter how many and what types, and then, aided by this knowledge, proceed to utilize the various culture media that will best ensure recovery of each organism in pure culture. Here is where the thoroughly trained bacteriologist will succeed and in the shortest time. It is often exceedingly difficult to recover a shyly growing streptococcus or tubercle baccilus occurring in small numbers, let us say from a urine practically alive with the bacillus coli. This may be accomplished by inhibiting or attenuating the growth of the hardier, more freely growing organism, by treating the culture medium in an appropriate manner, but unless this is accomplished it will be seen at once how useless it is to successfully treat pyelitis of streptococcal or tubercular origin by using only the B. Coli in the vaccine preparation. Hence the failure of many autogenous vaccines that are bacteriologically imperfect or incomplete.

In many cases of chronic gleet, however, the gonococcus is absent, and the catarrhal inflammation is kept alive by secondary invaders which may then, in combination, serve for cure in absence of the primary invader.

After getting out every bacterial group contained in a given specimen, each in pure culture, these should then be studied with a view to ascertain their share in the production or continuation of the disease in question and guided by experience, clinical as well as bacteriological, a final judgment of the organisms concerned may be passed and the proper ones selected for use in the vaccine. They may all be combined in a single ampoule or may be placed singly or in pairs. Only the lower dosages, however, can be reached by making a mixed vaccine composed of many elements on account of the combined dosage being too high to permit of safe injection.

We can now proceed to prepare the vaccine, in which the following steps are concerned:

1. To obtain an emulsion containing the bacteria impurity—an emulsion with a uniform suspension and as free from bacterial clumping as possible.

2. To standardize the emulsion—that is to determine how many bacteria are contained in each cubic centimeter.

3. To kill the bacteria in the emulsion and tube them—or

4. To decide upon the dosage of each ampoule or set of ampoules; to tube them still alive and then kill them.

5. To label, effectively, each ampoule and place them in sets of ten in compartment-boxes or cartons, the lids of which are to be specifically marked with the names of the organisms they contain and in what dosage and, most particularly, with directions for their use.

6. To be sure that all "controls" are sterile before allowing the vaccine set to leave the laboratory for use.

I shall not, in this paper, enter in detail into the technique required in the actual preparation of the vaccine, but I want to say a word or two of caution regarding the best ways of killing the bacteria without impairing their immunizing properties. This can only be accomplished by a thorough knowledge of an observance of the thermal death-point of each group of organisms; a knowledge that will tell you which bacteria should be killed by heat, and which by chemical measures, or by a combination of the two. If by heat, at what temperature and for how long sustained? If by chemical sterilization, by what chemical and in what strength? I have known many autogenous vaccines—otherwise quite appropriately selected bacteriologically and faultlessly prepared, to be inert and to fail absolutely therapeutically, for no other reason than that the thermal and chemical death-points were not carefully ascertained. And I doubt not that this applies equally to many stock vaccines.

Have we in vaccine therapy a means sufficient to combat all types of bacterial infections? I would answer emphatically "No," and I would add that harm may often come from their indiscriminate use and from use in the hands of the inexperienced and careless.

In epidemic meningitis, in typhoid fever, in pneumonia, in generalized bacteremia, with or without ulcerative endocardial lesions, the use of vaccines for curative purposes has not been attended with great success, although, occasionally, a case is seen in which amelioration in severity of symptoms has taken place which rightfully or wrongly has been ascribed to the use of the vaccine. I am by no means yet convinced that their use in such cases is unjustifiable and believe that we may yet arrive by experience at some method of establishing appropriate dosage and proper intervals of injection for this class of acute fulminating infections that will produce better results.

The most suitable field for vaccines, and the field in which the most brilliant results have been obtained, lies in treatment of diseases, acute or chronic, that have local foci of infection, such as, furunculosis, carbuncles, abscesses, various bone diseases, such as osteomyelitis, various skin diseases, such as acne-vulgaris, infected sinuses, pyelitis, empyema, various infections of the mouth, such as pyorrhœa alveolaris, infections of the nose and nasal passages, various post-gonorrhœal conditions and various diseases of the respiratory tract, such as pulmonary abscesses.

And now a final word as to why vaccines fail in the hands of many workers, even in the above field of election—it is chiefly because of insufficient knowledge

governing the general laws of dosage and time intervals of injection; by selecting inappropriate points of injection; by disregarding the best time of day at which injection should be given, so that the patient is not protected during the "negative phase" period, at which his anti-body formation is at the lowest ebb, etc., etc. For information upon many of these points I would refer the student or interested worker, to a close perusal of monographs on this subject, notably, Allen on "Vaccine Therapy."

Finally, I would call attention to a common cause of failure from a neglect to realize that autogenous vaccines need to be freshly renewed—i. e., a new culture taken and a new vaccine prepared from cultures that represent more nearly the *status praesens* of the case, for it frequently happens that, in long chronic conditions, the bacteria by mutation or other biological properties, become adapted more or less to the anti-bodies formed in the tissues of the host.

I was asked, before reading this paper to this body, whether I did not think it quite feasible and proper for druggists to establish autogenous and stock vaccine departments for the purpose of themselves *making* these products. I do not think it is practical, nor fitting that you should, nor do I believe that the attempt would prove, commercially, a success. And I will close with the words of Sir Almroth Wright, one of the pioneers in this work, who states that for such skilled service as that demanded for vaccine therapy,—"is required a man who has spent years of study to master the technic; to know how to make the vaccines; to know where to look for the microbes; to know how to isolate them; and, most of all, a man with sufficient experience and ability to apply all these things."

DISCUSSION BY DR. JOSEPH HEAD.

Vaccine treatment is only successful when all the depots of infection of the body have been first eliminated by careful diagnosis and judicious treatment. This is particularly the case with pyorrhea alveolaris which I have treated with autogenous vaccines in over seventy cases. Judicious co-operation with the family doctor should be established. All local depots of infection in the mouth should be removed by surgical means in order that the antibodies formed in the blood by the vaccine should have full opportunity to come in contact with the areas of infected tissue. If this is not done and the bacterial masses are left around the teeth and in the gums the antibodies can only attack the exterior portions of this bacterial mass and failures will inevitably result from the vaccine treatment.

I have found in my bacterial examinations of pyorrhea-pockets that there are six principal germs, viz., staphylococcus, streptococcus pyogenes, streptococcus viridans, micrococcus catarrhalis, bacillus influenza, pneumococcus and diphtheroids. In the cases just mentioned these predominate in over 95%, there being an occasional scattering of tetragenus, Friedlander's bacillus and an occasional unrecognizable germ. The reason that my results have been so consistent is probably due to the fact that the technique used for obtaining the material for the autogenous vaccine is such as to exclude the extraneous flora of the mouth.

This technique is as follows: A thin platinum spear of 1/3000 of an inch in thickness is used for obtaining the material for the vaccine. The external portion of the pocket is cauterized with a cautery, then the thin platinum spear heated to a cherry red is plunged to the bottom of the pocket. When this is withdrawn the material contained thereon is supposed to come from the deep walls of the pocket where the controlling infection is supposed to reside. The spear, on being removed, is streaked across the blood agar and sent to the laboratory the same day, where the bacteria are carefully segregated and mixed, according to their species, in the sterile salt solution. Streptococci, micrococci catarrhalis, pneumococci

and bacilli influenza are made up 50 million to the cc. and staphylococci made up 300 million to the cc.

The dosage is a very important factor in this treatment. We should remember in giving vaccines that we are dealing with a substance as vital for good or evil as strychnine or belladonna. Vaccines are not simple remedies as Vaughan's investigations have so beautifully shown. It is my habit to start with a dose containing about five million streptococci and thirty million staphylococci. This is increased steadily week by week until either the full cubic centimeter is given or the patient shows signs of reaction which is made evident by nausea, congestion of the forehead, faintness, purging of the bowels or sharp neuralgic or gouty pains. When these are developed and last for over twenty-four hours, it is always a sign that the dose should be stopped temporarily for a week and then given in very much reduced quantities,—one-half at least. This should be slowly and cautiously raised again, and if possible, kept within the amount that will reproduce the reaction, as it has been my experience that small doses give better results than large. We should always be on the lookout for reaction in giving our doses. Sometimes five or six doses of the same size can be readily accepted and the seventh dose will give a sharp severe reaction. This, according to Vaughan, would indicate that the digestion of the vaccine in the blood has not been complete, and the protein poison is being developed faster than the body can eliminate it.

In closing, I would say that the vaccine treatment is of unquestioned value and in obstinate cases should always be given a fair trial.

A WORD ABOUT PACKAGES AND LABELS.

People are very exacting as to what comes from a drug store; not only must the goods be of the best quality, but the packages in which they are put up must appeal to the sense of neatness. The dry-goods clerk, the shoe clerk, the grocer —in fact, salesmen in all other trades—do not care much about the appearance of the packages they send out. A sheet of paper twisted or rolled around the article, a piece of string, and the thing is done; and nothing better is expected. But with the druggist it is different. We wonder how many druggists appreciate the effect of a neatly-tied package or a simple, neatly-printed label, upon their customers. And yet we know of people who prefer a certain store to another for no other reason than that the goods sent out of it are neater than those coming from the other. What is true of parcel wrappings also holds for labels. A great deal of improvement is noticeable in this respect within the last twenty years. We remember the fantastic labels sported in many drug stores at the time the Japanese art craze swept this nation. Label makers swam with the stream, and some of their efforts were gorgeous beyond belief—so gorgeous that the lettering on the labels was completely lost in the maze of decorative detail. Labels of this kind are seldom seen nowadays, but they turn up once in a while in some obscure village. The intelligent public would not tolerate such things nowadays.

Have your packages neat and your labels plain.—*National Druggist.*

Contributed and Selected

INFECTION AND IMMUNITY—A REVIEW.

N. S. FERRY, PH. B., M. D., RESEARCH LABORATORY, PARKE, DAVIS & CO., DETROIT, MICH.

(Continued from page 568.)

6. SPECIAL PHENOMENA OF IMMUNITY. It has been shown that antitoxins, according to Ehrlich's scheme, are cast-off receptors of the first order, and that in order to explain other phenomena occurring in immunity, as agglutination, precipitation, cytolysis, bacteriolysis, and hemolysis, it becomes necessary to demonstrate other orders of receptors.

Agglutinins. In 1895 Grüber and Durham discovered that when a few drops of an antibacterial serum were added to a suspension of homologous or corresponding bacteria, the micro-organisms within a short time would be found in clumps. This phenomenon was termed agglutination, and was said to be due to definite bodies in the serum called agglutinins. The practical application of this reaction to the diagnosis of typhoid fever was brought out independently by Grünbaum and Widal, although Widal was the first to publish his results. The Widal reaction, or the phenomenon of agglutination, may be produced by most of the antibacterial serums, and observed, therefore, in many of the bacterial infections, although the reaction is variable, and is more specific and definite in some than others. The cast-off receptors or agglutinins, which have to do with the formation of the clumps in the phenomenon of agglutination, have not only a haptophore affinity as in the case of receptors of the first order, but also another group, called a zymophore group. When an animal is immunized to a certain micro-organism, these receptors of the second order are formed along with others, and many of them of course are liberated. These cast-off receptors or agglutinins, therefore, attach themselves to the specific bacteria by means of the haptophore affinity, and produce the agglutination by means of the zymophore group acting upon these attached micro-organisms. The haptophore group selects and picks up the bacteria, while the zymophore group produces the reaction.

Precipitins. The receptors concerned in the precipitation reaction are formed similar to those in the agglutination reaction. When the blood or serum of a human being is repeatedly injected into the peritoneal cavity of a rabbit, the serum of that rabbit acquires the property of precipitating the human serum, if mixed in the test tube. The receptors or precipitins are formed and liberated

during the injections of serum into the rabbit. These receptors have a haptophore affinity which attaches itself to the serum of the human being, while the zymophore group produces the precipitation. If the serum of this rabbit is mixed with the serum of any other animal, the reaction will not take place, for this haptaphore group can only attach itself to human serum, and the zymophore group can only react when the haptophore group is thus attached. The reaction is, therefore, a specific test for the presence of blood.

Cytolysins. It has been found that when suspensions of various cells are injected into an animal, certain substances are formed in that animal and found in the serum which are injurious to cells similar to those injected. The cells injected may be bacterial cells, blood cells, epithelial cells, renal cells, hepatic cells, and others, but it must be borne in mind that the destructive bodies are specific only for the kind of cells injected. For instance, if we inject red blood cells from a human being into a rabbit, then the serum of that rabbit will be injurious to human red blood cells but not to kidney cells or liver cells, and not red blood cells of any other species. It can be seen that in order to explain this phenomenon it becomes necessary to have a more elaborate receptor or side chain than for any of the previous combinations. At least two distinct substances are formed which react upon the cells in question, and these two substances must be able to combine with each other before the reaction can take place. These two combining substances are termed amboceptor and complement. The amboceptor, the immune body or receptor, is formed by the body cells during the process of injecting the red blood cells, bacteria or other cells, while the complement is always present, and, therefore, a normal constituent of the serum. The immune body or amboceptor, which is the cast-off receptor, must not only be able to unite with the specific cell, similar to the antitoxin of the first order, and the agglutinin of the second order, but go a step further and unite with another substance or body, the complement. It therefore must have two haptophore affinities, one for the complement and one for the specific cell. The final reaction, the destruction of the cells, is produced, however, by the complement, and although this is present in the normal serum, it cannot perform its function without the aid of the amboceptor, which is only formed by the injection of the cells.

Opsonins. In studying the action of phagocytes on bacteria, it has been found that it is not primarily a reaction between the leucocytes and bacteria, as was thought by Metchnikoff and his school, but is a more complicated reaction. Wright and Douglas have demonstrated that certain substances in the blood serum are necessary before the reaction can take place. These substances which act upon the bacteria and prepare them for the leucocytes, are called opsonins. What sort of changes the opsonins produce in the bacteria, rendering them susceptible to the action of the leucocytes, is not known.

Hektoen and Rurdiger have shown that the opsonins resemble the toxins, in that they apparently have a toxophore and haptophore group, one to unite with the bacteria and the other with the leucocytes. The relationship between the opsonins and the other immune substances, as the agglutinins and cytolysins,

has practically been proven, so it appears that the opsonic theory represents a connecting link between the phagocytic theory of Metchnikoff and the side-chain theory of Ehrlich. It may possibly be demonstrated, in the future, that Ehrlich's theory is simply an aid in explaining the action of the phagocytes in infection, and that, after all, the leucocytes may have the most important part to play in the phenomena of immunity.

7. ANAPHYLAXIS AND SERUM SICKNESS. One of the best descriptions of anaphylaxis is given by Hiss and Zinsser. "By anaphylaxis is meant the following train of phenomena: When a foreign proteid is introduced by subcutaneous, intraperitoneal, intravenous or subdural injection (or in some cases by feeding) into the animal body, after a time there will appear a specific hypersusceptibility of the animal for this proteid. After a definite interval, a second injection of the same substance, harmless in itself, will produce violent symptoms of illness and often rapid death in an animal so prepared. The phenomena are not limited to any given class of proteids, but are manifest in the case of animal, vegetable and bacterial proteids, and within certain limits are specific." A typical reaction may be seen in a guinea pig which has been injected with normal horse serum. Following an extremely small initial dose of the proteid (0.004 cc.) the anaphylactic state usually develops after ten to fourteen days. After a large dose the time required for the development of the anaphylaxis is usually longer; it may even extend over weeks or months. Many theories have been offered for the explanation of the phenomenon of anaphylaxis, but none are at all satisfactory. Without going into the exposition of these different theories,, we will take up one which seems to offer the most plausible and at the same time the simplest interpretation of all.

It has been found that the proteid molecule, on being split up by chemical methods, contains a toxic and a non-toxic substance. It has also been determined that this toxic substance is unlike the toxin formed by the diphtheria bacillus, in that it does not produce a neutralizing body similar to antitoxin, when injected into an animal. It does seem to produce, however, a substance or body resembling the hemolysins, termed proteolysin, which is capable of breaking up any molecule of the same substance, which may be subsequently injected after a certain length of time. The hemolysins break up the red blood cells, setting free the toxic portion. The toxic portion of the proteid molecule is extremely poisonous, and if enough is set free in the animal, fatal results will follow within a few minutes. By making a direct application of this theory, let us see how anaphylaxis may take place in a guinea pig. A small amount of horse serum (0.004 cc.) is injected into a guinea pig. The proteid of this serum contains a toxic substance, which, acting upon the guinea pig, produces a body we have called proteolysin. The body does not form at once, but appears to take about ten days, and when once formed will remain in the guinea pig for the remainder of its life. Now after the required interval the guinea pig is again injected with horse serum, this time, however, with a much larger dose. The body or substance, the proteolysin, which was formed by the guinea pig following the first dose of serum, now acts upon the proteid of the second dose of

serum, splitting it up at once into the toxic and non-toxic parts. On account of the large amount of serum constituting the second dose the amount of toxin set free must be relatively large, and acting upon the tissues of the guinea pig produce a train of symptoms recognized as the phenomenon of anaphylaxis. Vaughan and Wheeler, of Ann Arbor, were able to separate the proteid molecule into a toxic and non-toxic portion, and with the toxic portion experimentally produce symptoms similar to anaphylaxis, so it would seem that the theory so far is well founded.

The facts as regards anaphylaxis of which we are practically certain are as follows:

1. A condition of hypersusceptibility or hypersensitiveness is produced when a small quantity of proteid is injected, and a condition of immunity is produced when a sufficiently large dose is given.

2. The symptoms are more severe and specific the smaller the first or sensitizing dose, to a certain limit.

3. If a dose is given the animal some time between the first or sensitizing dose, after the first day, and the second or fatal dose, a condition of antianaphylaxis is produced which immunizes the animal to the fatal dose.

4. The condition of anaphylaxis may be transmitted from a sensitized animal to another through the serum, which is termed passive anaphylaxis.

5. The condition of anaphylaxis may be transmitted from mother to offspring.

6. Animals sensitized to one proteid are not sensitive to subsequent injections of other proteids; the reaction, therefore, being more or less specific.

7. The quantity for the second injection should be considerably larger than the first or sensitizing dose.

8. Animals recovering from the second injection are thereafter immune to the same substance.

9. After ten days following the sensitizing dose the animal is always susceptible to the second dose.

Other phenomena somewhat of this nature, which probably depend upon the principles involved in anaphylaxis, or at least in hypersensitization (allergy), are seen in the tuberculin and mallein reactions. The animal or individual is probably sensitized by the primary infection, while the injection of the mallein or tuberculin produced the typical reaction, which is slight, and which is due to the small amount of the dose. If the dose is large very severe symptoms or even death have been known to follow. Another condition or reaction, which has been compared to anaphylaxis, is that of serum-sickness. It has been known for several years that the injection of antitoxic sera in human beings is often followed by various skin eruptions, pain in the joints, swelling of the lymph glands, often albuminuria and fever. These symptoms appeared after an incubation of from two to ten days. It was also early found that these symptoms had nothing to do with the antitoxic reaction of the serum, but were dependent upon properties peculiar to the serum itself. Normal horse serum will produce

the same symptoms. It seems certain that anaphylaxis has something to do with these conditions, but we are unable to determine the exact relationship. Anaphylaxis in animals only follows the second injection, whereas serum-sickness often follows the first injection. The patient is the more liable to the condition the greater the number of injections given. The size of the dose does not seem to make much difference in serum-sickness. The phenomenon of serum-sickness is seen in about 20 per cent. of the cases injected with antitoxic serum. The symptoms may at times be troublesome, but fatal cases traceable to serum-sickness are unknown, or at least have not been proven. There are a few cases on record where death followed suddenly on the injection of antitoxic serum, but these are very rare, although very magnified by opponents of serum-therapy. This condition has been termed sudden death. While it would appear, in explanation of this condition, that the fatal symptoms were traceable in some way to anaphylaxis, other suggestions have been offered which seem much more plausible, as they have been to a certain extent, backed up by the post-mortem findings, such as the shock of the injection upon an already overburdened heart, or upon one suffering from the condition known as status lymphaticus.

Knowing that the larger part of the antitoxin is contained in the globulins of the serum, it has been found advantageous to use these globulins in the prophylaxis and treatment of diphtheria in place of the whole serum. As a result, the percentage of cases of serum sickness have been greatly reduced. This is explained on the assumption that as the amount of proteids injected are necessarily decreased, the chances of proteid poisoning are lessened. Although serum sickness is of less frequent occurrence than formerly, showing the relative increase in the safety of the globulin over the whole serum, yet a point has been raised as to the relative immunizing value of the globulins as compared to the whole serum, and, along the same line, the relative value of serums of high antitoxic potency as compared to those of low. It has been suggested that we do not obtain the same results, unit for unit, with serums of concentrated antitoxic content as we did when this method of specific therapeutics was first inaugurated and large quantities had to be injected due to the low antitoxic content of the serums. That is to say, some maintain that we do not obtain relatively the same therapeutic results, from the immunity point of view, with 1 cc. of a globulin containing 3000 units per cc. or 3 cc. of a serum containing 1000 units per cc. as we did with 10 cc. of a serum containing only 300 units per cc. This is a point which only time and experience can answer.

The following table will compare fairly well the three conditions, according to the facts we have been able to obtain up to the present time:

Anaphylaxis.	Serum Sickness.	Sudden Death.
1. Condition is manifest only after second injection.	1. Condition often manifest after first injection.	1. Condition usually manifest after first injection.
2. Symptoms appear within an hour. Difficult to kill within five minutes.	2. Symptoms usually appear after an incubation from two to ten days.	2. Symptoms appear immediately.
3. Very severe symptoms, usually resulting fatally.	3. Symptoms disappear within a few days and leave no bad results.	3. Symptoms always result fatally.
4. Fatal dose must be very large in proportion to therapeutic dose for man. 5 cc. for a guinea-pig, corresponding to 3 pints for a man.	4. Size of dose of little importance.	4. Size of dose apparently not important.
5. Animal must be "sensitized" by a previous dose of the same proteid, with an interval of at least 10 days.	5. Previous dose apparently not necessary.	5. Previous dose apparently not necessary.
6. If a dose is given the animal some time between the first dose and the fatal or second dose, the animal will be immunized to the last dose.	6. Not known; experimental.	6. Not known.
7. The condition of anaphylaxis may be transmitted from a sensitized animal to another through the serum (Passive Anaphylaxis).	7. Not known.	7. Not known.
8. The condition of anaphylaxis may be transmitted from mother to offspring.	8. Not known; may be possible.	8. Not known.
9. Animals sensitized to one proteid are not sensitive to subsequent injections of other proteids.	9. Not known; probable.	9. Not known.
10. Animals recovering from the second injection are thereafter immune to the same substance.	10. The patient is the more liable to the condition the greater the number of injections given.	10. .....

8. RELATION OF BIOLOGIC PRODUCTS TO IMMUNITY.

Bacterial Vaccines (dead bacteria), active immunity.
Smallpox Vaccine (attenuated virus), active immunity.
Blackleg Vaccine (attenuated organisms), active immunity.
Anthrax Vaccine, Pasteur (attenuated organisms), active immunity.
Antitoxic Sera (blood serum), passive immunity.
Antibacterial Sera (blood serum), passive immunity.
Tuberculins (dead bacteria and bacterial products), active immunity.
Rabies Vaccine (attenuated virus), active immunity.

RESEARCH LABORATORY, PARKE, DAVIS & COMPANY.

PREVENTION OF GASTRIC DISTURBANCE BY SODIUM CARBONATE, IODIDS, OIL OF SANDALWOOD AND SIMILAR DRUGS.

EDGAR G. BALLENGER, M D., AND OMAR F. ELDER, M. D.

For a number of years we have been working to discover some method of obviating the gastric disturbance which is produced by remedies such as potassium iodid, oil of sandalwood, sodium salicylate, sodium carbonate, etc. This we have finally and satisfactorily accomplished. Remedies, such as oil of sandalwood, creosote and oleoresins administered in soft gelatin capsules may be prevented from disturbing the stomach by the process of hardening with formaldehyde the capsules in which they are placed.

Only slight hardening is necessary, especially if the capsules are kept for some time, as additional hardening comes with age. At first we immersed the filled capsules for one minute in a dilution of 1 part 40 percent formaldehyde solution to from 40 to 60 parts of water. The strength should vary with the aging allowed.

From the time that the dilution mentioned is used two weeks should be allowed to intervene before administering the capsules. A more satisfactory method of preparing the capsules is to place them in open boxes in a closed vessel in which they are subjected to the vapor of the solution of liquor formaldehydi. About 15 cc. of the solution should be used for each cubic foot of space in the closed vessel. The solution should be placed on cotton or gauze in a saucer or tray. The time required for hardening the capsules varies with the temperature and with the time that is to be allowed before they are administered. Six hours' exposure or less is enough for capsules which are not to be administered at once, while twelve hours may be necessary in preparing capsules for immediate use. These estimates are made for ordinary soft gelatin capsules at the ordinary room temperature, from 70 to 75° F. The capsules become hardened so that they are not digested by the gastric juice, but are digested by the intestinal secretion, if they have not been subjected too much to the vapor, in which case they may pass undigested. If dilatation of the stomach is present and the capsules or food do not pass into the intestines within the usual time, a greater degree of hardening of the capsules may be necessary. For the ordinary normal person capsules prepared as previously described will prevent gastric disturbances by carrying the medicament into the intestines before the capsules burst.

An even more satisfactory method of carrying through the stomach such remedies as sodium carbonate, potassium iodid, sodium salicylate, etc., is obtained by combining the desired remedy with mutton-suet and paraffin. When incorporated in such a mass the medicament is uniformly carried into the intestines without dissolving, as the stomach does not secrete a fat digestant. The suet is digested as it passes down the intestines and thus

gradually the drug embodied in it is liberated. The paraffin is added to give additional hardness. The following combination is recommended:

		gm. or cc.	
℞	Sodii carbonatis monohydrati.....	90	℥ iii
	Potassii iodidi.....	90	℥ iii
	Sodii salicylatis.....	90	℥ iii
	Sevi	30	℥ i
	Paraffini	16	℥ iv

M. et fiat mass.

All the ingredients should be melted over water and while melted encapsulated in 00 gelatin capsules. The capsules may be filled with a fruit spoon. The melted mixture should be of a creamy consistency, and the salt used should be previously powdered. The encapsulated product is a mass of the salt, the suet and the paraffin, is hard and remains unaffected by the gastric juice.

In the use of sodium carbonate, in the treatment of Bright's disease, as suggested by Martin H. Fischer, we have found this method of administration of decided value, as formerly it was quite difficult for the patient to take alkali in sufficient amounts to render the urine neutral or alkaline without producing gastric disturbance, with coated tongue and other symptoms.

The manner in which albuminuria and casts have disappeared under this treatment has been quite remarkable. A number of patients who had been declined as risks by insurance companies because of albuminuria and casts have been passed by the insurance examiners after a few months of alkaline treatment. In order to secure the desired result we have added ¼ grain of phenolsulphonephthalein to each capsule of the monohydrated sodium carbonate preparation and have advised the patients to take from five to eight capsules daily as indicated to keep the urine light pink. This method constantly assists in regulating the amount of alkali to individual and varying requirements. The patients do not object to the use of the monohydrated sodium carbonate when so administered and can continue it over a prolonged period, when necessary. Potassium iodid so administered does not disturb the stomach, but produces its other physiologic and therapeutic effects.

In the use of remedies such as pancreatin, which it is desirable to liberate at once in the intestines and not to have dissolve slowly, ordinary gelatin capsules should be subjected to the formaldehyde vapor as suggested for the soft gelatin capsules. These capsules do not digest in the stomach and therefore carry the remedy they contain through without its being acted on by the gastric secretion. The remedies which we suggest to be incorporated in the suet and paraffin cannot well be given in ordinary gelatin capsules, as they may cause intestinal disturbance by liberating the entire amount of monohydrated sodium carbonate or potassium iodid at one point in the intestine instead of gradually freeing the mass as they pass down the tract.

We advise that in preparing the capsules controls of methylene blue and oil of sandalwood be used in test capsules. If the capsules have been insufficiently hardened a glass of carbonated water taken two hours after the

capsule has been administered will show by the eructation whether or not the capsule has broken in the stomach. If the capsules are subjected to formaldehyde vapor too long or if the gas be too strong the urine may be slow in becoming blue, or may remain unchanged. Capsules intended for immediate use may be subjected to considerably more formaldehyde than may be used on those which are to be kept for a few months.—*Journal A. M. A.*, Vol. 62, p. 197.

THE ART OF ADVERTISEMENT WRITING.*

A. W. BROMLEY.

Advertising is a branch of the art of business, but advertisement writing is a branch of the art of literature. If we could question the men who are writing the best of the advertisements we see in the daily press I am sure we should find that the majority of them have passed to that work from the ranks of journalism, not from business. But the ability to write anything well consists principally of natural aptitude. Training is of less importance and is useless without the first qualification. The saying, "Poets are born, not made," is almost equally true of other writers. This sounds as though the chemist could not hope to write effective advertisements for himself. I do not think that is so. In the first place, it is impossible to write upon any subject without knowing something about it. and pharmacy is a difficult subject for an outsider to master. Secondly, the services of the really good men in the advertising business are not available for small retail shopkeepers in our business or any other. They are nearly all employed by the big agents and engaged upon the work of advertisers who are spending many thousands a year. I have seen the work of some of the self-styled experts, who offer their services to the drug trade, and I am convinced that the average chemist could produce better copy than anything I have seen from them.

Good Writing. I propose first to consider some of the ideals of good writing in general, and then to discuss their application to advertisement writing. You must remember that in writing you are setting the reader a task—to grasp, put together, and consider the thought you are expressing. You can make that task easy or difficult. Just take up in imagination a good but difficult novel of the Victorian period, and a bad but popular one published last year. You may find the former tires you if you are not very eager to read it, while the latter you can go on reading in spite of a gradually developing contempt. The reason is that the newer novel posesses the quality known as "readableness." You will see at once that this quality is absolutely essential in advertisement writing. The man who is reading a novel or a text-book may tolerate a style lacking this merit, because he hopes to enjoy or profit by his reading. But if he is reading an advertisement he has no particular desire to go on; he has only begun because

* Read before the North London Pharmacists' Association.

you have tricked him into doing so by means of a catchy headline or in some other way.

To write clearly you must have, first, a clear idea of what you want to say. Second, you must present your thoughts accurately and briefly, yet completely, and with a sense of proportion, emphasizing if possible what is most important. And you must avoid certain faults which will be likely to distract or confuse the reader. It is to the third requirement that I wish particularly to direct your attention. Suppose, for example, you drag in something that does not matter and does not help your argument. The reader may neglect your argument to consider it. Or, if you make a grammatical error or use a wrong expression, he will stop to criticise it. In either case, his mind is diverted from your argument to something else, and he does not grasp your meaning with the same clearness as if nothing had occurred to withdraw his attention.

Faults in Writing. The chief faults of a bad writer are—using words without considering their exact meaning, using too long sentences, and straining after effect. Some people write without thinking, using stock words and phrases. One of the worst offenders is, strange to say, a professional writer—the inferior journalist. With him a fire is a "devastating conflagration," an oyster is a "succulent bivalve," every funeral is a "solemn cortege," and a pathetic incident is always either a "touching" or a "heartrending" scene. It was a man of this type who announced the death of a celebrity as having occurred after a "short but protracted illness." Other expressions that would be avoided by thinking what a word means before writing it are "cheap prices," "very moderate," "very exceptional," "unqualified pharmacist." It is best for a writer who is not sure of his literary skill to use short sentences. There is far less risk of confusing himself and the reader. Always in advertisement writing I would recommend short sentences. Many short sentences following each other have a bad effect sometimes, but only in long compositions.

It is curious how a business man will write a dozen business letters in good English, and then write something for publication containing gross blunders. The reason is that he tries to be clever. I will not say, "Don't try to be clever," because if nobody tried to be clever probably nobody would be, and the world would be poorer. But the only cleverness desirable in writing is that which increases the clearness, force, or beauty of what you write.

A common fault in writing is to use too many words. This is called in different cases circumlocution, verbosity, tautology, and pleonasm. Circumlocution is an elaborate statement where a shorter, simpler one would convey the meaning quite as fully. All writing is a compromise between brevity and completeness; circumlocution errs on the side of the completeness. That sounds as though it were a good fault, but it is not; it is one of the worst. If you announce that your purse and money have been stolen, there is no need to mention that the money was in the purse. Legal language is often circumlocutory, but no doubt that is necessary. Verbosity is a form of circumlocution in which pompous language, out of proportion to the subject, is used. Sometimes circumlocution has a rhetorical or a humorous intention, in which cases it is justifiable. A schoolmaster once said to a boy who had left his study door open, "Let the

guardian of our secrets revolve upon its hinges." Tautology is where the same meaning is conveyed twice in different words; for example: It will cure your cough and drive it away. Pleonasm is the fault of including words in a sentence where the sense is complete without them, as in "They are both alike," "This is the better of the two." Pleonasm is often justifiable; it may make the meaning clearer. But in general superfluity is a bad fault in writing. Try to be as concise as possible. We can all think faster than we can read or speak; therefore, reading and speaking always delay thought. Superfluity delays it still more. That is why pictures are of such great value in advertising. A picture will convey in half a second what could not be conveyed in words in less than half a minute.

Slang to be Avoided. The word barbarism is used to indicate various outrages upon the language. Some would say that all slang is barbarism. I do not agree, but one must be very careful about slang. Consider the character of your composition before deciding to use a slang expression. Slang is inimical to dignity, but it may give vividness and force to a sentence. In general I would not use slang in advertisements. The ordinary writer must remember that he is not entitled to coin words; he must take the language as he finds it. Personally, I regard the use, by English business men of American business jargon, as barbarism—"loan" for "lend," "mail" for "post," "carry" for "kept in stock." "Gent." is an abomination of which tailors are very fond; also I do not like "Xmas" for "Christmas," though it may be used sometimes. A few days ago I saw the word "expensiveless," I hope I shall never see it again. Metaphors and metaphorical expressions are so common and add so much to the vividness of language that we use them every minute of the day. To say "see," and "feel," for "understand" and "think," is metaphorical. Metaphor brings an image to the mind, and the metaphor is bad if that image is a grotesque one. It it also bad if the metaphorical meaning can be confused with the literal one. To say, "He made a fatal mistake in the Minor," is a metaphorical use of the word "fatal," and quite a proper expression. But, "It is fatal to take a baby up every time it cries," is a bad use of the same metaphorical expression.

Ambiguity is another common fault. It often arises from incorrect or omitted punctuation. "William said John is a fool," is ambiguous; it requires either one or two commas. Ambiguity may also arise through putting a qualifying clause in such a position that it appears to refer to the wrong word. "Room to let for single gentleman, fifteen feet by ten." The woman who advertised, "Respectable woman wants washing," may have announced a fact without intending it. The commonest form of ambiguity arises in the use of pronouns. "He said that if he did that again, he would dismiss him at once," is quite clear, but it is an accepted rule that such sentences should not be written. Pronouns must not be used in such a way that the reader has to sort them out, as it were, and study the context to find their antecedents.

Anacoluthon is beginning a sentence in one grammatical form, and finishing it in another. "A hot-water bottle will make you nice and cozy and ensures sound refreshing sleep." Two verbs occurring like that must agree in tense. In this connection I would mention that a short composition must not be written

alternately in the first and the third persons. You must not say, "John Jones has opened the above premises," and later, "I keep only the best and purest drugs." Nowadays the first person is generally preferred for such announcements, but whichever you choose you must keep to it for that announcement. Solecism is the kind of mistake foreigners make. It is the mistake of a writer who knows a language but is inexperienced in the use of it. There are rules which we all observe, but none of us can quote, called Rules of Syntax. They direct us how to make our sentences; we master these rules in childhood without learning them. Solecism can generally be detected at once. We should say, "It sounds wrong," and perhaps the only explanation we could give would be, "We don't say that." Well! that is good enough. A living language is what the people speak, established more by custom than by rule. Remember that writing is subordinate to speaking. That brings us to a golden rule—when you have written anything of importance, read it aloud to see if it "sounds right." The best unskilled writers, and often the best skilled ones, are those who write just as they would speak.

I am not going to deal at great length with the merits of good composition. Most of the points I might be inclined to dwell upon make for elegance rather than force and clearness, and it is the latter qualities that are wanted in advertising. But in all writing, one quality is needed—judgment to decide what is, and what is not, worth saying, considering the object in view. Many a good idea is rejected because it will not be effective as an advertisement. I have seen advertisements containing philosophical reflections. They are not wanted. Get to the point quickly, and save the printer's ink you have paid for, and the time the reader values.

The Choice of Words. And the next great essential in advertisement writing is the habit of choosing the most vivid language possible, without overstepping the border line between sense and absurdity. Short words are more vivid than long ones, specific terms are more vivid than general terms, concrete terms are more vivid than abstract terms, definite terms are more vivid than indefinite terms. Metaphor and simile give vividness. "Icy wind" is more vivid than "cold wind." "Hard as a rock" is more vivid than "very hard." Just compare these as I repeat them: Sank rapidly, sank quickly, sank at once, sank like a stone, sank like lead. The last two are most vivid, because the idea is conveyed in concrete terms. Of the others, you would prefer "sank quickly." I will tell you why in a moment. Now compare these: Has cured many, cures everybody who tries it, has cured thousands. The last is most vivid and therefore best, because it is definite, in spite of the fact that the second makes a more sweeping claim. Again compare: "Relieves all distressing symptoms," with "cures the nasty headache and the disagreeable giddy feeling." The second is better because it is specific.

Even among words which are not figurative some are more vivid than others. Onomatopoetic words, that is words which are an approximate representation of sounds or things they indicate, are the best examples of vivid words—crash, bang, whistle, tinkle, crackle, whine, howl, chatter. Below these, in the scale of vividness, are many words which seem to have at least some sympathy with

their meaning—quick, slow, mournful, terrible, horrible, enormous, tremendous, magnificent, tiny, rush, dash, rattle. All these are vivid because the sound, as well as the meaning conveys the thought expressed. Now consider the little word "very." It may be described as a word that has failed. It is the reverse of vivid, and it has had its punishment. In every age, probably, we have put aside this little word with a big meaning in favor of something else. Today the substitutes are "awfully" and "beastly," ugly but vivid words. In the eighteenth century, "vastly" was, I believe, the favorite pseudo-synonym.

How to Secure Attention. An ordinary advertisement has to do three things in succession. First, to secure attention; second, to argue its case; and, third, to give the information the reader will require if he intends to respond. There are many ways of securing attention, but the commonest, and one of the best, is by means of a "striking" headline, which would be better called a "catchy" or "interesting" headline. The inferior advertisement-writer seems to think that any three or four words in big type is a good headline, but a really good headline must be interesting, it must promise to talk about something that will interest the reader. This is where the journalist excels, for it is part of his training to value news items according to their interest. Here are a few of the commonest interests. General—humanity, news, topical, puzzling, humorous. Masculine—success, politics, sport. Feminine—personal adornment, children, domestic affairs. There are also special interests as, for example, a person suffering from rheumatism is interested in that complaint. Now if your headline contains such words as, let us say, man, woman, girl, child, sensation, amusing, mystery, money, fortune, football, golf, beauty, baby, home, or if it contains a reference to some political or other event of the moment, it will catch the eye of hundreds of people as they glance over the paper. Unconsciously they will read on and so get your message. If the argument is a good one, and it appeals to their want, there is a chance that business may result. Now for the argument. Deal briefly and as vigorously as you can with the point or points most likely to appeal to the reader. Don't spoil things by trying to say everything that can be said. And, in choosing those points, the chemist, working day by day at his own counter, has an immense advantage over the professional advertisement writer. Note what questions the public ask, when you push your own specialties at the counter. Finally, don't leave the reader without the information he will want if he is going to respond to your advertisement—name of article, price, and your name and address.

The best advertisments of all are those which appeal to the imagination, because the writer makes use of the reader's brain, and, by means of, perhaps, a dozen words, causes the latter to think out an argument that could not be conveyed in less than a hundred. "Good morning, have you used Pears' Soap?" is, I consider, the finest advertisement in the English language. It makes use of the reader's brain, though not quite in the way I have indicated. Here is an example of what I mean. As an apprentice I used to pass a shop bearing the legend, "Where Maggie got her home for £6." Think of the tremendous effect that sign would have upon the working-class couple who were prepared to spend, say, £12. They would feel that they were in a position to furnish a

palace—that they had got £6 to spare for luxuries—things that Maggie who, none the less, got a complete home, had to go without.

I have brought with me a few instructive advertisements which I will show you, and we will consider their points. One thing you will gather is this—if you want to learn how to advertise, study the advertisement columns of papers where space is expensive; if you want to see how not to do it turn to those papers where you can get about six inches of double column for a sovereign.—*Pharm. Jour. and Pharmacist (London.)*

THE INTELLECTUAL LIFE OF AMERICA.

While the sum total of American intelligence is undoubtedly impressive, it is more by reason of its quantity than its quality. I mean that the educational system of the country has rather raised a great and unprecedented number of people to the standard of what we in England should call middle-class opinion than raised the standard itself, and that as a consequence the operative force of American politics is middle-class opinion left pretty much to its own devices and not corrected by the best intelligence of the country. And middle-class opinion, especially when left to its own devices, is a fearsome thing. It marks out the nation over which it has gained control as a willing slave of words, a willing follower of the fatal short-cut, a prey to caprice, unreasoning sentiment and the attraction of "panaceas," and stamps broadly upon its face the hall-mark of an honestly unconscious parochialism. Such, to be quite candid, appears to me to have been too much its effect in America. I know of no country where a prejudice lives so long, where thought is at once so active and so shallow and a praiseworthy curiosity so little guided by fixed standards, where a craze finds readier acceptance, where policies that are opposed to all human experience or contradicted by the most elementary facts of social or economic conditions stands a better chance of captivating the populace, or where men fundamentally insignificant attain to such quaintly authoritative prestige.—*Sydney Brooks.*

Of General Interest

MINUTES OF A MEETING OF THE EXECUTIVE COMMITTEE OF THE NATIONAL DRUG TRADE CONFERENCE HELD AT THE NEW WILLARD HOTEL, WASHINGTON, D. C., WEDNESDAY, MARCH 18, 1914.

The Executive Committee of the National Drug Trade Conference met in the Gridiron Room of the New Willard Hotel, pursuant to the call of the President of the Conference, Wednesday, March 18, 1914, at 10 o'clock a. m.

Present: All the members of the Committee.

Mr. John C. Wallace and Mr. Chas. M. Woodruff were, respectively, unanimously chosen Chairman and Secretary of the Committee.

The minutes of the last meeting of the Committee as printed were approved without reading.

On motion of Prof. Jas. H. Beal the Committee proceeded to consider the Harrison Bill as amended by the Finance Committee of the Senate and on the Senate Calendar under No. 213, Report No. 258. The following amendments were duly recommended:

Page 1, line 1. Make "January" read "October."

Page 2, lines 1, 2 and 3. Strike out the words "or hypodermic syringes or needles adapted to administer any of the above drugs," or else insert the words "except veterinary hypodermic syringes and needles, and hypodermic syringes and needles designed and used for the administration of serums, vaccines, toxins and analogous products."

Page 2, lines 12 and 16: If the hypodermic syringe provision is stricken out, then strike out the words "or articles."

Page 2, line 18: Note typographical error in the word "provided."

Page 2, lines 20, 21, 22, 23, 24, and page 3, lines 1 and 2: "Strike out all after the word "section" in line 20 to the end of the paragraph on page 3, line 2, and insert in lieu thereof the following:

"Provided, further, that officers of the United States Government who are lawfully engaged in making purchases of the above named drugs [and articles] for the various Departments of the Army and Navy and for government hospitals and prisons, and officers of any state government, or of any county or municipality therein, who are lawfully engaged in making purchases of the above named drugs or articles for state, county or municipal hospitals or prisons and officials of any territory or insular possession of the United States who are lawfully engaged in making purchases of the above named drugs for hospitals or prisons therein shall not be required to register and pay the special tax as herein required."

Page 3, line 3: Insert after the word "person" the words "obliged to register under the terms of this Act." The Act requires *every one* having anything to

do with the production, manufacture, sale, giving away or dispensing, to register and then excepts certain officers of the Federal and State Governments.

Page 3, lines 5 and 21: "If the hypodermic syringe provision is stricken out, then strike out the words "or articles."

Page 4, lines 1 and 2, also line 9: If the hypodermic syringe provision is stricken out, then strike out the words "or articles."

Page 4, line 19: If the hypodermic syringe provision is *not* stricken out insert the words "or articles" after the words "drugs."

Page 5, lines 6 and 7: Strike out the words "registered under this Act."

Page 5, line 2. After the word Act add the following provision:

"Provided also that a record of the drugs thus dispensed shall be made in a suitable book kept for that purpose, and shall be preserved for two years in such a way as to be readily accessible to inspection by the officers, agents, employes and officials hereinbefore mentioned."

Page 5, lines 4 and 17: If the hypodermic syringe provision is *not* eliminated insert the words "or articles" after the word "drugs."

Page 5, lines 5 and 10: Make the word "pharmacist" read "dealer."

Page 5, line 11: Strike out the letter "s" in the word "prescriptions."

Page 5, line 12: Make the words "each prescription" read "the same."

Page 5, after subsection (c) add the following:

"(d) To the sale, barter, exchange or giving away of any of the aforesaid drugs (or articles) to any officer of the United States Government or any state, county or municipal government lawfully engaged in making purchases thereof for the various departments of the Army and Navy, and for government, state, county or municipal hospitals or prisons."

Page 6, line 23: If the hypodermic syringe provision is eliminated strike out the words "or articles."

Page 7, line 5: If the hypodermic syringe provision is eliminated make the word "articles" read "drugs"; if not, insert the words "drugs or" after the word "said."

Page 7, lines 1, 3, 11 and 21: If the hypodermic syringe provision is eliminated strike out the words in italics.

Page 7: Insert after the first paragraph and between lines 5 and 6 the following:

"The provisions of this Act shall apply to the United States of America, the District of Columbia, the District of Alaska, the Territory of Hawaii, the Insular Possessions of the United States, and the Canal Zone. In Porto Rico and the Philippine Islands the administration of this Act, the collection of said special tax, and the issuance of the order forms specified in Section 2, shall be performed by the appropriate internal revenue officers of those governments, and all revenues collected hereunder in Porto Rico and the Philippine Islands shall accrue intact to the general governments thereof, respectively. The courts of first instance in the Philippine Islands shall possess and exercise jurisdiction in all cases arising under this Act in said Islands. In the Canal Zone, the administration of this Act, the collection of the said special tax, and the issuance of the order forms specified in Section 2, shall be performed by such officer or officers in said Canal Zone as the President may designate for that purpose. The courts of the Canal Zone having jurisdiction of crimes and offenses committed

in said Zone shall have jurisdiction to hear, try, and determine all actions and proceedings in which any person shall be charged with having violated any of the provisions of this Act within the limits of said Canal Zone."

Page 8, lines 2 and 24: If the hypodermic syringe provision is eliminated strike out the words "or articles."

Page 8, lines 5 to 11 inclusive: Strike out all after the word "Act" to the end of the section and insert in lieu thereof:

", or to any person who shall deliver any such drug or article which has been prescribed or dispensed by a physician, dentist or veterinarian who has been specially employed to prescribe for the particular patient receiving such drug or article."

Page 10, line 5: Make the word "one-twelfth" read "one-fourth."

Page 10, lines 16, 17 and 18: Strike out the provision reading: "Provided, that the amount of any drug herein mentioned shall be shown upon the label of the container of such remedy or preparation."

Page 11, lines 7 and 8: If the hypodermic syringe provision is eliminated strike out the words "or articles."

Page 11, line 12: After the word "person" insert the words "or to a nurse under the supervision of a physician, dentist, or veterinary surgeon registered under this Act." *This amendment will not be necessary if the hypodermic syringe provision is stricken out of the Act.*

Page 11, line 13: If the hypodermic syringe provision is *not* stricken out of the Act insert the words "or occupation" after the word employment.

Page 11, lines 14 and 18: If the hypodermic syringe provision is *not* stricken out insert the words "or articles" after the word drugs.

The Conference then took a recess for lunch and re-convened about 2:30 p. m.

On motion a number of bills which had been referred to the Executive Committee by the last Conference (see page 9, Proceedings of the National Drug Trade Conference held January 13, 1914), were referred to a special committee consisting of Prof. Jas. H. Beal, C. Mahlon Kline and Chas. M. Woodruff, with instructions to prepare briefs to be submitted to the chairman of the proper congressional committee after they had been first submitted to and approved by the members of the Executive Committee.

On motion, duly seconded, put to vote and carried, the Secretary was requested to inquire of the Chairman of the Committee on Revision of the United States Pharmacopœia what probable action would be taken by the Revision Committee in the way of adopting standards of shapes, colors, etc., of Mercury Bichloride tablets.

On motion of Prof. Jas. H. Beal, duly seconded, put and carried, the Secretary, Dr. A. R. Dohme and Dr. J. C. Stover were appointed a special committee to interview the proper authorities of the Postoffice Department respecting some law or regulation that would permit the mailing of medicinal preparations containing poisons; and that the Committee be authorized to use discretion in pressing an early settlement of the question.

Bill H. R. 13305 was then read, and on motion duly seconded, put and carried, the Secretary was instructed to inform the Chairman of the House Committee to

which it was referred that the Executive Committee of the National Drug Trade Conference favored the principle of price standardization involved in the measure, although the Committee was not prepared to express an opinion upon the bill in all its details.

A communication was then read asking that the Conference endorse the following resolution:

"*Resolved,* That the National Food Trades Conference does hereby recommend the appointment of a competent Federal Commission by the President by and with the consent of Congress authorized and directed to investigate the pure food and drugs laws of such foreign nations as may appear most advisable, and their administration and enforcement and to report fully the result of such investigation, which report shall include a statement of the existing laws, regulations, standards, methods and such other information as may be of interest, which report shall be published and made available for general use."

On motion duly seconded, put to vote and carried the resolution was received and referred to the Conference.

On motion, duly seconded, put to vote and carried, Dr. A. R. L. Dohme was requested to confer with the Revision Committee of the National Formulary and induce them to reduce the quantity of heroin in official mixtures from one-third to one-quarter grain per fluidounce.

There being no further business to consider, the Committee adjourned.

CHARLES M. WOODRUFF, Secretary.

KNOW WHAT YOU WANT—THEN GO AFTER IT.

"Half the failures, half the fellows who never get beyond holding down an unimportant job at only a small salary," said an employer of many men the other day, "have quite as good brains and education as the chap who goes by them like an express train past a post. Only he knows exactly what he wants, and goes after it with all there is in him. You can't stop the one kind—and you can't boost the other."

How about you? Do you know what you want?

If you do know, thoroughly and clearly, and want it hard enough, you'll get it. Or at least you'll come mighty close to getting it, and you'll certainly be one of the movers, not one of the stickers in life.

If you know what you want you won't be haphazard in your aims, and your energies will be directed into a single channel. There won't be what efficiency experts call "waste movements."

Try then, right away, to arrive at a clear understanding of what you want. After that study out the steps necessary to get it and begin on the nearest one.

You will be more than astonished to find how this distinct knowledge helps—how the things you do begin to count, how the waste wood is cleared out and the trail you mean to follow grows plainer.—*The Western Druggist.*

The Bulletin Board

SECTION ON EDUCATION AND LEGISLATION.

To the Members of the American Pharmaceutical Association:

It is desirable that at the 1914 convention of the Association there be provided for the Section on Education and Legislation a program of papers and discussions that will be commensurate with the importance of this division of the organization. The chairman therefore would ask that the members, not only those who are interested directly in educational and legislative matters, but particularly the practicing retail pharmacist who is directly affected by all conditions arising under educational and legislative practices, to contribute papers for the section or to acquaint him of their willingness to participate in the discussion of topics of general interest.

In this connection he wishes to offer the following topics as of general interest:

1. The comparative real and permanent benefits to the student of laboratory work and lectures.

2. The comparative advantages of practical experience and general education as a prerequisite of instruction in a college of pharmacy.

3. The advantages of the Association itself formulating standards for pharmaceutical teaching institutions and pharmacal examining boards.

4. The necessity for getting representation of the various interests embraced by the Association in the consideration of legislation.

It is not the intention of the chairman to limit papers or discussions to these topics, as he quite well recognizes the variety of subjects that may well be brought before the section. Very truly yours,

HUGH CRAIG.

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THE WOMEN'S PHARMACEUTICAL ASSOCIATION.

The regular monthly meeting of the Women's Pharmaceutical Association of the Pacific Coast was held in the assembly hall, Pacific building, San Francisco, March 27, 1914. Mrs. R. E. White, the president, was in the chair.

Difficulties in spreading asafoetida plasters; syrup of hypophosphites and syrup of hypophosphites comp., acetic acid in eye drops, London purple and taka-diastase were discussed during the roll call.

Mrs. White had a very carefully prepared paper on various methods of preparing cold cream and samples of U. S. P., G. P. and B. P. cold creams. Miss Roehr read a paper prepared by Mrs. Rees on "Ventilation in Drug Stores." The discussion of the evening was on the proposed Recipe Book of the American Pharmaceutical Association and was opened by Dr. Winslow, followed by Mrs. White, Mrs. Kane and Miss Roehr.

The next meeting of the Association will be held in San Francisco, April 24, 1914.

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UNIVERSITY OF ILLINOIS SCHOOL OF PHARMACY.

The 54th commencement of the University of Illinois School of Pharmacy (Chicago College of Pharmacy) was held at Howard's theatre, Chicago, on Wednesday afternoon, April 22. The principal address was made by Prof. John Uri Lloyd on the subject, "The Young Pharmacist's Opportunity." President Edmund J. James, of the University of Illinois, conferred the degree of Graduate in Pharmacy upon a class of thirty-three candidates as follows: Albert F. Anderson, St. Johns, Ariz.; Edna Becker, Davenport, Ia.; August C. Bosch, Gratiot, Wis.; J. Burdette Brown, Tampico, Ill.; Floyde W. Bryant, Elizabeth, Ill.; George E. Canham, Neponset, Ill.; Lawrence Converse, Chicago; Walter A. Endee, Chicago; Oscar Fisler, Chicago; Jeremiah G. Garrity, Spring Valley, Ill.; Harry F. Haines, Farmer City, Ill.; Philip I. Hildebrandt, Lake Mills, Wis.; Elwood J. Hollinshead, Morrisson, Ill.; Harry E. Johnson, Rockford, Ill.; Jonathan G. Jordan, Chicago; Elmer C. Lane, Kankakee, Ill.; Paul I. Mendelsohn, Chicago; Richard W. Merschat, Chicago; Abraham Myerson, Chicago; Charles C. Orr, Chicago; Irving F. Pearce, Chicago; Elmer E. Rueckert, Lake Mills, Wis.; Harold Schmid, Chicago; Ralph H. Thompson, Earlville, Ill.; Adrian Ton, Chicago; Clio Vavra, Chicago; Ladislaus J. Warzynski, Chicago; Albert J. Cook, class of '13, Terre Haute, Ind.; George C. Kraemer,

class of '13, Chicago; Wm. A. Lee, class of '13, Chicago; Alva W. Rackaway, class of '13, Mt. Vernon, Ill.; Chas. F. Wach, class of '13, Chicago; Mary L. Smith, class of '09, Dallas City, Ill.

Seven others received certificates as follows: Paul W. Edgett, Earlville, Ill.; Hubert S. Huston, Carthage, Ill.; Gennaro D. Lavieri, Chicago; Fred L. Leib, Anna, Ill.; Albert Schreiner, Batavia, Ill.; Frank J. Vondrasek, Chicago; George Vaupell, Chicago.

Prizes were awarded as follows: The Becker prize, Jeremiah G. Garrity; the Herman Fry prize, Miss Edna Becker; the faculty prizes, consisting of A. Ph. A. memberships: in materia medica, Albert Anderson; in pharmacy, Albert Schreiner, Jr.; in chemistry, George Vaupell.

In the evening the Alumni Association held its annual reception and banquet at the Congress hotel. The members of the graduating class were the guests of the evening. A feature was the reunion of the class of 1889, which celebrated its 25th anniversary. Toasts were responded to by President Edmund J. James, of the University; Mr. L. L. Abbott, of the board of trustees; Mr. George P. Mills, President of the Alumni Association; Acting Dean W. B. Day; Mr. Wm. A. Converse, of the class of '89, and Mr. Ralph Thompson, President of the class of '14. Professor A. H. Clark presided as toastmaster. About 150 of the alumni and their friends attended.

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COMMENCEMENT OF THE ATLANTA COLLEGE OF PHARMACY.

The commencement of the Atlanta College of Pharmacy for the class of 1913-14 took place at the Atlanta theater on the evening of March 30, and in spite of a tremendous downpour of rain during the day and night, there was an excellent attendance. There were forty-two graduates who took the degree of Ph. G., and two who took the degree of Ph. C. All the exercises of the evening were carried out by the faculty and the students without any assistance from outside speakers. Mr. William Tee Morgan, of Alabama, was the salutatorian; Mr. S. C. Davis, of North Carolina, the historian; Mr. R. C. Powell, of Georgia, the poet, and Mr. S. C. Moon, of Georgia, the valedictorian. All four acquitted themselves in a most excellent manner. The degrees were conferred by the president and the professors, five out of the six professors are licensed pharmacists as well as graduates in pharmacy; all of them have been successful in the drug business. The attendance of the college during the past college year has been made up by students from every state from North Carolina to Texas and west to Arkansas, with a good sprinkling of Cubans.

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UNIVERSITY OF THE STATE OF NEW JERSEY.

DEPARTMENT OF PHARMACY.

A series of lectures is given at the College of Pharmacy of the University of the State of New Jersey, which is located at 96 Summit Ave., corner Clifton Place, Jersey City.

The third of these lectures was given Friday, January 30, in the lecture room of the college. The subject was, *Preparation, Sterilization, Preservation and General Uses of Modern Vaccines and Anti-Sera.* The lecturer was Dr. Max Lederer, Pathologist to the Jewish Hospital of Brooklyn, who is a man of reputation and who is well known in medical as well as pharmaceutical circles.

The lecture was well attended by the faculty and the students of the college as well as by pharmacists and physicians of Jersey City.

These lectures will be continued throughout the winter and will deal with subjects of interest to the pharmaceutical and medical profession.

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ALUMNI ASSOCIATION OF THE MASSACHUSETTS COLLEGE OF PHARMACY.

At the annual meeting of the above association held at the College Building in February, the following officers were elected for the ensuing year:

President—Prof. E. H. LaPierre.

Vice Presidents—R. Albro Newton, G. W Russell, T. J. Connors.

Secretary—John D. Glancy.

Treasurer—Leon A. Thompson.

Auditor—Harold Jenness.

Council—Frank Piper, A. W. Balch, T. J. O'Brien, C. E. Tracy and Paul C. Klein.

Editorial Notes and Announcements

JAMES H. BEAL, Editor.....Scio, Ohio

ERNEST C. MARSHALL, Associate Editor,
63 Clinton Building, Columbus, Ohio

All communications for insertion in the JOURNAL, or respecting advertising should be sent to the Editor.

The Association does not accept responsibility for the opinions of contributors. Offensive personalities must be avoided.

Under the rules of the Postoffice the JOURNAL can be regularly mailed only to bona-fide paid subscribers. Subscriptions and association dues should be sent to the Treasurer, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Requests for back numbers, and claims for missing numbers should be sent to the Editor.

Claims for missing numbers will not be allowed if sufficient notice has not been given of change of address, and in no case if received later than sixty days from the date of issue

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REPRINTS.

If the request is made at the time copy is submitted, authors will be furnished with not to exceed 50 reprints, without cover, of papers accepted for publication in the JOURNAL.

Larger numbers of reprints will be supplied by the Stoneman Press Co. at the following prices, provided the order is received before the type has been distributed:

100 copies, 4 pages, no cover, $2.50, with cover, $4.50.

200 copies, 4 pages, no cover, $3.00, with cover, $5.50.

50 copies, 8 pages, no cover, $2.75, with cover, $4.50.

100 copies, 8 pages, no cover, $3.50, with cover, $5.00.

200 copies, 8 pages, no cover, $4.50, with cover, $6.50.

50 copies, 12 or 16 pages, no cover, $4.00, with cover, $5.50.

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200 copies, 12 or 16 pages, no cover, $6.50, with cover, $8.00.

Orders for reprints may be sent either to the Editor, or to the Stoneman Press Co., Columbus, Ohio.

WHY NOT?

One of the most enthusiastic A. Ph. A. workers sends this to the Editor, and the latter takes pleasure in passing it on to the officers and members:

Why not put these questions to every officer and committeeman of the A. Ph. A.?

1. What are you doing for the American Pharmaceutical Association?

2. Do you contribute any original papers?

3. Do you take an active part in the proceedings of your nearest branch?

4. Do you tell your medical and pharmaceutical friends what it means to be a member of this great organization?

5. Do you think it just to ask for further recognition without giving anything in return?

6. Why not get busy at once; you may be required to give an accounting at the Detroit meeting?

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ADDITIONAL PRIZE MEMBERSHIPS.

It will no doubt interest the members to learn that two prizes of nominations to memberships in the Association are offered in the Department of Pharmacy of the University of the State of New Jersey.

One is offered by Prof. J. Leon Lascoff, Professor of Pharmacy, and is to be given to the post-graduate student writing the best thesis on a pharmaceutical subject; the other is offered by Prof. Otto Raubenheimer, Professor of Pharmaceutical Chemistry and the History of Pharmacy and Chemistry, and is to be awarded to the post-graduate student writing the best thesis on a chemical subject.

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STATEMENT OF OWNERSHIP, MANAGEMENT, ETC.

Of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, published at Columbus, Ohio.

Editor—J. H. BEAL, Scio, Ohio.

Managing Editor—J. H. BEAL, Scio, Ohio.

Business Manager—J. H. BEAL, Scio, Ohio.

Publisher — American Pharmaceutical Association, Office at Scio, Ohio.

Owners — The American Pharmaceutical Association, Office, Scio, Ohio.

Is a corporation not for profit, incorporated under U. S. Laws at Washington, D. C., and does not have a capital stock.

Known bondholders, mortgagees, and other

security holders, holding 1 percent or more of total amount of bonds, mortgages, or other securities: None.

(Signed) J H. BEAL, Editor.

Sworn to and subscribed before me this 28th day of March, 1914.

(Seal) HARRY A. ECKMAN,
Notary Public.

(My commission expires Jan. 10, 1916.)

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BEWARE OF SUIT-CASE PEDDLERS.

Druggists should beware of suit-case peddlers who sell manufacturers' products at attractively low rates—lower usually than those at which even the jobber can buy. If it should appear that pharmaceuticals so purchased had been stolen, and if the druggist purchasing them should be complained of for receiving stolen property, it would be difficult to convince a jury that the circumstances had not put the druggist upon his inquiry and that the druggist had purchased in good faith. Irregular brokers are being watched by manufacturers and wholesalers who have been the victims of systematic robbery.

According to Kansas City journals, Grover Buckland, 28 years old, an employe of the McPike Drug Company, has been arrested, tried, convicted, and sentenced to a year in the penitentiary for theft of opium, morphine, etc., from his employer. The thefts were systematic and continuous; but, of course, conviction was upon a single instance. Buckland about three years ago was discharged from the Kansas City office of Parke, Davis & Co. on account of pilfering. Buckland's output was through one Miller, who is yet to be dealt with.

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SCALES AND WEIGHTS.

The first step in, what is said to be, a nation-wide attempt to secure greater accuracy in the scales in use in drug-stores has been taken in Massachusetts, where the State Commissioner of Weights and Measures has directed his deputies to inspect the scales and weights used in the preparation of prescriptions, as well as those used in the sales of articles by the ounce and pound.

The Commissioner says:

"I have not yet secured many official and signed reports from the various sealers who are making this investigation. Their informal reports indicate conditions that will need extensive improvement. I am not prepared to say what percentage of scales will be found to be defective, but there is little doubt that hundreds of scales will have to be seized.

"The point that to me has seemed most important is that the customer who goes to a drug store with a prescription to be compounded must expect that absolute accuracy shall be guaranteed by the fact that he is dealing with a competent pharmacist. Yet competent pharmacists may queer the remedies prescribed by the physician if their scales are even slightly off. The doctors expect that the ingredients of a prescription will be combined in exact proportions. It is of great importance that they shall be so combined. If the scales prevent such accuracy, the results are likely to be unfortunate in almost all cases, and it is quite conceivable that in some cases they might be serious. Lives in fact may be jeopardized.

"This to me is far more important than other aspects of the situation. The percentage of loss to the customer is likely to be small. He will not pay for any large amount of merchandise which he does not receive. Apothecaries' scales are delicate things. There is a vast difference between weighing drugs and zinc or potatoes. Quantities are smaller. The customer's gain or loss will be relatively smaller. But it is also to be considered that drugs usually cost more than potatoes."

That there is need for such inspection is shown in a paper read before the Washington Branch of the A. Ph. A. which was published in the April issue of THE JOURNAL, under the title of "The Laboratory Equipment of the Pharmacist," in which it was stated that one pharmacist of that city uses a prescription-balance composed in part of string and that a drachm weight in actual use weighed 71.6 grains.

If such a state of affairs exists in the Capital City of the nation, it would seem to indicate an imperative need for some general action to ensure more care and attention to be given to the very essentials of the correct and precise preparation of medicinal preparations. In Fitchburg and in Worcester, Mass., many scales have been reported as inaccurate, and in one small town it was reported that in all the stores inaccurate scales were found and in one of these stores all the scales were condemned.

The heart of a drug store may be said to be its scales and balances,—not its cash resgister,—and a condition which would not be tolerated in the latter should not be permitted to exist in the former, and it is to be regretted that it should require official action to ensure the correct doing of things which should be a matter of course in every drug store worthy of the name.

Proceedings of the Local Branches

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

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SAINT LOUIS BRANCH.

The Saint Louis Branch of the American Pharmaceutical Association met in the Saint Louis College of Pharmacy on March 20, with J. A. Wilkerson presiding.

The reading of the minutes and all preliminary matters were dispensed with to give the time to the discussion of the paper. Dr. Gustav Rehfeld gave "Some Facts and Demonstrations on Lloyd's Reagent and Alcresta Alkaloids." The paper appears elsewhere in this issue. Dr. Rehfeld was extended a vote of thanks for his paper and his interest in the Branch.

The following took part in the discussion of the paper: Miss E. Kingsland, Theodore R. Schwerdtmann, Victor H. Kremmenacher, Ambrose Muller, Francis Hemm, William K. Ilhardt, Chas. H. Horton, Leo Suppan, O. J. Cloughly, J. M. Good, F. W. Sense, M. J. Noll, David S. Ralston, Paul L. Goodale, Stephen E. Ludwig, W. F. Kahre, J. A. Sanger, Edmund D. Amour, Ward H. Lee, Gustav Kring, John O'Kane, A. C. Boylston, O. L. Biebinger, Chas. E. Caspari, C. T. Buehler, Chas. Gietner, J. A. Wilkerson and J. W. Mackelden.

JULIUS C. HOESTER, Secretary.

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CITY OF WASHINGTON BRANCH.

The stated March meeting of the City of Washington Branch of the American Pharmaceutical Association was held at the National College of Pharmacy on March 18, 1914, and called to order by the President, W. S. Richardson, at 8:15 p. m. A good attendance was noted.

The first subject of the evening was "Price Standardization," by Mr. J. Leyden White. Mr. White graphically described conditions in pharmacy today and traced the origin of cut prices to monopoly. He presented House Bill 13305, a bill "to prevent discrimination in prices and to provide for publicity of prices to dealers and to the public." The history of this bill, as well as the origin of the Fair Play League, was related, and also the "ins" and "outs" of price protection.

While the reception of this bill before noted has not been overly cordial in Congress, Mr. White stated that a number of those who had radically opposed it at the outset had been won over, without the loss of any of the original supporters.

After hearing his address, the branch tendered Mr. White a vote of thanks.

Mr. Martin I. Wilbert then read a paper on "Russian Oils," wherein he gave a complete history of their origin, use in medicine, their preparation, and alleged medicinal virtues. He further invited attention to the fact that the average retailer can purchase these oils at 80 cents a gallon and bottle them himself and have a product superior to that for which he is paying 40 to 60 cents a pint under fancy names.

In the absence of Mr. S. L. Hilton, who has made extended observations of these Russian oils recently, Dr. H. E. Kalusowski read his paper, which covered his experiments with all the leading brands of oils on the market. Samples were exhibited and their merits reported. In addition, Mr. Hilton has made many experiments to produce a wholly satisfactory aromatic oil. Samples of these, thirty or more in number, were exhibited and passed among the members for inspection. The samples flavored with cardamom, natural wintergreen and the combined oils used in aromatic elixir (compound spirit of orange) attracted much favorable comment.

Following a full discussion of the matters which had been brought before the branch by the addresses made and the papers read, the branch adjourned.

The next meeting will be April 15, 1914.

HENRY B. FLOYD, Secretary.

CINCINNATI BRANCH.

Prof. John Uri Lloyd presided at the March meeting of this branch, which was held at the Lloyd Library on the tenth of the month. The report of the Secretary was read and approved, and letters were read from Hon. William Gordon and Hon. W. Gard in approval of House Bill No. 1.

Miss Lydia DeCourcy read an admirable paper entitled "Woman in Pharmacy." At its conclusion she was given a vote of thanks and it was voted to request the JOURNAL to publish the paper in full.

Mr. H. W. Jones gave a very interesting address on "Digitalis and Opium." He described the action of the active principles of digitalis, and said that the tincture was not the most efficient form in which to administer this drug; that the best form to exhibit it is the official infusion made from properly selected leaves. Speaking of opium he called attention to the variability in morphine content of different samples, and said that absorption by the drug of moisture from the air or the abstraction of water from the drug by a dry atmosphere was responsible for that variation, which was often a difference of 5 to 6 percent from normal. The drug therefore should be kept in air-tight containers and should be assayed just prior to its use in manufacturing official preparations. He described "normal opium" as having a percentage composition of morphine 12 percent, narcotine 5 percent, codeine 6 percent, meconic acid 1 percent. There was a general discussion of the paper by the members, after which Mr. C. A. Apmeyer read a paper entitled, "Notes on Heat and Temperature," in which he described the various kinds of thermometers in use, and the reasons for the selection of alcohol and mercury in their construction. He called attention to the fact that in melting ice in a capsule over heat, that the temperature remains constant to 0° C., although heat is continuously applied, until the ice is melted, and after that occurs and the liquid begins to boil, the temperature remains constant to 100° C. until the last particle of water disappears. From these facts we may reason that some relation exists between the state of aggregation of a substance and that agent which we call "heat." It was heat which liquefied the ice and it was heat which converted the water into steam, yet the temperatures remained constant to 0° C. and 100° C. A certain amount of heat is unaccounted for. What has become of it? He explained the production of heat by friction and said that an intimate relation existed between the amount of heat generated and the amount of energy expended, which connection was stated as The Law of the Correlation of Energy. We must come to the conclusion that heat is associated in some way with the condition of the molecules of which all bodies are composed. He explained the kinetic energy and the potential energy of molecules, and said that when heat was applied to a body it either increased the motion of the molecules (the kinetic energy) or made a change in the position of them (the potential energy), or it may produce both effects. When the movements of the molecules are accelerated, there occurs a rise in temperature, which can be measured by a thermometer. What is called "temperature" is the degree or intensity of the sensible heat of a body. Heat is absorbed whenever solids pass into the liquid state or when liquid bodies pass into the gaseous condition, as in the manufacture of artificial ice or in a freezing-mixture. The heat added to a body without producing increase of temperature, is absorbed in changing the relative arrangement of its molecules and is known as "latent heat." Mr. Apmeyer concluded his discourse with a discussion of the "Increase of Volume Caused by Heat," referring particularly to the expansion and contraction of gases, in which connection he quoted The Law of Charles: "If the pressure remains constant, the volume of the gas increases regularly as the temperature increases and decreases as the temperature decreases." An interesting discussion followed the reading of this paper, in which Professors Lloyd and Wetterstroem and others participated.

On account of the convention of the American Chemical Society, which was held in Cincinnati, April 6-10, the meeting was adjourned until May.

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NEW YORK BRANCH.

A regular meeting of the New York Branch of the American Pharmaceutical Association was held on the evening of March 9, with Dr. H. V. Arny presiding.

The minutes of the previous meeting were read and approved, as was also the treasurer's report.

The membership committee introduced Dr. M. R. Smith as a new member of the local branch and parent association.

As Professor W. C. Anderson, Chairman of the Committee on Legislation, could not be present, his report was read by Dr. Joseph L. Mayer, which report reviewed such proposed legislation affecting pharmacy as was pending at Albany and Washington.

Mr. McElhenie, representative of the branch in the Council of the American Pharmaceutical Association, read a letter from G. M. Beringer, President of the A. Ph. A., favoring the adoption of the coffin-shape as the official form for tablets of mercuric chloride in the new edition of the U. S. P. He indicated that, while the Norwich Pharmacal Co. had applied for patent on this form of tablet, they would be willing to assign all rights to the A. Ph. A. Mr. McElhenie stated that he favored the acceptance of this firm's offer and indicated that he had voted accordingly.

A letter from Mr. Hugh Craig, addressed to the Council, was read, and in this letter he indicated that in his opinion it was a waste of time to endeavor to formulate a restriction as to the shape of tablets of mercuric chloride. Mr. Craig further indicated that it appeared to him that the Association should not take a hand in the manufacture of, or the supervision of the manufacture of any article of commerce.

Mr. McElhenie also read Mr. Beringer's reply to Mr. Craig's letter, in which Mr. Beringer expressed the belief that Mr. Craig had failed to grasp the real situation presented in the Council letter and stated that the question of the official shape of tablets of mercuric chloride is only one of the means of safeguarding the careless handling of the tablets, and the idea was not presented as the sole means that should be adopted. Mr. Beringer agreed with Mr. Craig that it was necessary to educate the public to the importance of exercising the proper care in the handling of all poisons.

Mr. Berger, Chairman of the Committee on Professional Relations, reported that a joint meeting of the County Medical Association and the branch would not be held during this season, but that a propaganda meeting would be held in May, at which Professor Remington would be invited to present information concerning the progress that is being made in the revision of the Pharmacopœia.

Doctor G. C. Diekman, as Chairman of the Committee on the Progress of Pharmacy, reported in detail on a new reaction for acetylacetic acid in urine and the detection of albumin in urine by means of Eschbach's reagent in presence of hexamethylen-tetramine. He also called attention to the necessity of testing cod liver oil for free iodine, especially when it was to be made into a mixture with other substances. Dr. Diekman also called attention to the fact that foreign countries were not free from the misbranding evil, and cited as an example, a product offered in Germany as boranium berries, which upon examination were found to consist of a mass of sugar to which had been added phenolphthalein, oil of peppermint, and a fruit gelatin, while the name would indicate that the item offered was a berry gathered from a plant or tree. He stated that many such instances were noted in current numbers of foreign pharmaceutical publications. This report was discussed by Messrs. Diner, Raubenheimer, Weinstein, Mayer and Roemer.

The speaker of the evening was Dr. Curt P. Wimmer. His subject was "Colloids and Their Importance to Pharmacy." Little was learned of colloidal chemistry until during the past fifteen years, although true colloidal solutions have been prepared as far back as 1802, stated the speaker. He pointed out that Thomas Graham, an English scientist, made the first systematic investigation along these lines during the early sixties, but states that the present view of the nature of colloids is diametrically opposed to that of Graham, who distinguished two worlds: the crystalline and the colloid world. The present accepted view is that there is but one world, and that the colloid state can be assumed by any substance, solid or liquid, under appropriate conditions.

The speaker indicated that the invention of the ultra-microscope gave great impetus to the work on colloids. As a general definition for colloidal solutions, Dr. Wimmer stated a colloid is a solid, liquid or gaseous substance in a certain state of subdivision or dispersion, in another solid, liquid or gaseous substance. Dr. Wimmer dealt at length with the preparation of colloids and their mechanical, optical and electric properties, together with the osmotic pressure, gravity, jellification, coagulation, pectinization and absorption of colloidal substances. His lecture was generously illustrated by interesting experiments.

and both Dr. Wimmer and his assistant, Dr. Jeannot Horsmann, were given a vote of thanks by the branch. A discussion followed, in which Messrs. Roemer, Diner, Raubenheimer and Mayer participated.

Under the auspices of the New York Branch of the American Pharmaceutical Association a joint meeting of pharmacists and physicians will be held on the evening of May 18th at 8 o'clock at the College of Pharmacy Building, 115 West 68th St., New York City.

The subject will be "Pharmacopœial Revision." Professor Remington, of Philadelphia, Chairman of the Committee of Revision, will lead the discussion.

It is earnestly hoped that all pharmacists in and about New York will attend this meeting and at the same time bring with them as many of their physician friends as possible.

FRANK L. MCCARTNEY, Secretary.

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DENVER BRANCH.

The March meeting of the Denver Branch of the A. Ph. A. was held Tuesday evening, March 24th, at the Albany hotel. The following members were present: Messrs. E. Powers, W. T. Hover, L. A. Jeancon, H. SeCheverell, W. S. Payne, F. J. Lord, S. T. Hensel, L. L. Alkire, W. A. Hover, S. L. Bresler, W. O. Scholtz, A. W. Clark, A. Swobodia, A. C. Cole, C. J. Clayton, B. Strickland, C. H. Skinner, S. T. Kostitch, J. P. Dow, Prof. J. Seymour and F. W. Nitardy.

The meeting was called to order by President Hover about 8:15. The minutes of the February meeting were read and approved and the Secretary reported that a copy of the resolution on the Harrison bill passed last month had been forwarded to Senators Shafroth and Thomas; also that the matter of a refund to the branch of a portion of the annual dues had been taken up in the Council.

The Library Committee reported that most of the books for the library had arrived and that everything would be in shape for the formal opening for the April meeting.

Dr. S. L. Bresler read a paper entitled, "Should Our Present Pharmacy Law be Enforced or Amended?" He called attention to the objectionable elements which had crept into the profession and queried whether these could be eliminated without more precise definition by law of the terms "pharmacy" and "drug store," a precise statement of what persons shall be given the right to conduct these two establishments, and more power being granted to the Board of Pharmacy "to revoke licenses and to close pharmacies if in their discretion the store is a detriment to humanity." He was of the opinion that a stricter enforcement of the law would result in knowledge which would be of great assistance in formulating new legislation. Dr. Hensel's paper was very favorably received and was discussed by Messrs. Hensel, Hover, Clayton, Nitardy, Clark, Scholtz, SeCheverall, Cole and Clark. Secretary Nitardy called attention to the new A. Ph. A. button and received orders for twenty of the same, which he agreed to have at the next meeting.

Mr. A. W. Clark then read a very interesting paper "On Trade Conditions," which the pressure upon our columns of other matter forces us to defer printing until a later issue.

A lasting applause showed the appreciation of those present of this valuable paper.

President Hover opened the discussion by complimenting Mr. Clark for the carefully prepared paper which furnished so much food for thought. He commented on the economic waste referred to in Mr. Clark's paper in connection with the prescription departments of the small store and expressed the hope that pharmacists would co-operate to eliminate this waste by consolidation of prescription departments or such other means as might be available.

Messrs. SeCheverell, Jeancon, Clark, Hover, Hensel, Seymour and others took part in the further discussion of this subject. Mr. Jeancon brought out the value of profitable side lines and propaganda work to help out in the prescription department, especially to help reduce the stock of many proprietaries that often have to be carried. He also stated that buying new articles short from another druggist in just the quantity called for on the first one or two prescriptions had saved him much money, as in a great many instances there was no further call for an article after the first prescription.

President Hover's paper on "Bank Credit" was, on account of the lateness of the hour, deferred to the next meeting.

There being no further business the meeting adjourned.

F. W. NITARDY,
Secretary.

PITTSBURGH BRANCH.

The regular monthly meeting of the Pittsburgh Branch was held at the College of Pharmacy, Friday evening, April 17. Owing to the unavoidable absence of the secretary, Dr. Louis Saalbach recorded the proceedings. The important feature of the evening was the illustrated lecture by Dr. L. K. Darbaker on "Medicinal Plants," in the presentation of which Dr. Darbaker was ably assisted by one of the members of the Senior class of the college, Harry B. Honaker. In opening the subject Dr. Darbaker said, "The average pharmacist is not usually familiar with many of the plants which yield official drugs, and," he added, "for that reason I propose to test the knowledge of those who are present by putting into each person's hands a sheet of paper numbered to correspond with the slides as they are thrown on the screen, and will ask that each will put down his guess as to what particular plant is as it is shown without identification. I will then run the series a second time, giving the correct names of the plants, when we shall see what we shall see."

The correctness of the doctor's statement was abundantly certified to by results, as comparatively few sheets were found to bear any appreciable number of proper identifications. The pictures formed a very instructive lesson in botany, and the entertainment furnished was valuable as well as interesting.On the whole it proved a very excellent example of the very little we know of the source and origin of many drugs with which, in their commercial shape, we are very familiar, and many of which we handle in our every day work.

The second number on the program, "Activities of Enzymes and Bacteria," by Dr. J. H. Wurdack, was fully as interesting and instructive as the preceding one, although along a widely different line of study. After a short talk covering the subject of enzymes in general, Dr. Wurdack proceeded to explain in detail the cycle which nitrogen follows in passing from one compound to another. He discussed the various nitrogenous compounds of animal excretion and decomposition and their change into ammonia salts; nitrites and nitrates which are used by plants to form the numerous proteids that serve as food for animals and are, through the latter, reverted back to the activities of ammonia, forming bacteria, thus completing the nitrogen cycle. He also explained quite lucidly the activities of the ammonifying, nitrifying and denitrifying, nitrogen-fixing micro-organisms, ending his talk with an account of the reactions occurring in biological sewage disposal. A full discussion followed the doctor's lecture, and he was asked many questions on the subjects that had been covered, all of which he very satisfactorily responded to.

The lateness of the hour precluded the taking up of the next number on the program. "Discussion of Heroin Sale, Legal and Moral Status."

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PHILADELPHIA BRANCH.

The regular monthly meeting of the Philadelphia Branch was held on Tuesday, April 7, at the Drug Club. President E. F. Cook called the meeting to order promptly at 8 p. m. During the short business session which preceded the scientific program of the evening, Mr. J. Rosin was elected to membership in the Branch, and Mr. Theodore Campbell was elected Treasurer for the ensuing year to replace Mr. M. M. Osborne, who was compelled to decline the office because of ill health.

The scientific program was particularly interesting because of the many recent developments and improvements in the use and preparation of biological products and the large attendance of physicians and pharmacists proved that the program was well appreciated.

The following papers were read:

1. Theory Underlying the Use of Serums and Vaccines—By Dr. A. P. Hitchens.

2. A Consideration of Autogenous Vaccines from the Standpoint of Their Preparation and Administration—By Dr. Vincent Lyon.

3. Phylacogens: History, Theory, Preparation, Indications, Dosage and Clinical Results—By Dr. F. C. Waldecker, of New York.

4. Clinical Results from the Use of Curative and Prophylactic Sera and Vaccines—By Dr. J. Hamilton Small.

(The first two papers are printed in this issue.)

The discussion which followed the reading of the papers was participated in by Drs. S. Solis-Cohen, Joseph Head and F. E. Stewart, and also by Messrs. F. M. Apple and W. L. Cliffe.

It was pointed out that the results obtained from the use of bacterial vaccines were not

always encouraging and that stock vaccines as well as autogenous vaccines give variable results under different conditions. In answer to a question propounded by Dr. Apple as to the length of time required for the preparation of autogenous vaccine, Dr. Lyon pointed out that the average length of time would be about seventy-two hours. Dr. Lyon further stated that he believed the preparation of autogenous vaccines would be unprofitable for pharmacists.

The next meeting will be devoted to a consideration of legislative matters.

The executive committee has outlined the following subjects to be discussed during the meetings of the coming year:

"Newer Remedies." (Joint meeting with physicians.)

"Recent Advances in Chemistry."

"Changes in U. S. P. and N. F."

"Commercial Subjects."

"Where May We Expect Modern Pharmacy to Lead"?

"Regulation of Sale of Narcotics and Habit-Forming Drugs and of Poisons."

It is the intention of the committee to arrange with the different Colleges of Pharmacy for lectures on and demonstrations of the new methods and tests of the U. S. P. IX.

ROBERT P. FISCHELIS, Secretary.

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NEW ENGLAND BRANCH.

The annual meeting was held on Wednesday evening, April 22d, at the Hotel Plaza in Boston. After the dispatch of routine business, the following officers were elected for the ensuing year:

President—Fred A. Hubbard, Newton, Mass.

Vice President—F. W. Archer, Dorchester, Mass.

Secretary-Treasurer—R. Albro Newton, Southborough, Mass.

Chairman, Committee on Professional Relations—Frank F. Ernst, Jamaica Plain, Mass.

Chairman, Committee on Membership—William H. Glover, Lawrence, Mass.

The gathering was a joint meeting of the Branch and the Boston Association of Retail Druggists.

Dinner was served at 7 o'clock, after which the following speakers were heard: John R. Sawyer, William H. Glover, R. A. Newton, Frank F. Ernst, and Elie H. LaPierre on "Individual Propaganda," Fred W. Connolly on "Liquor in the Drug Store," and James F. Finneran on "The Attitude of the State Sealer on Apothecaries' Weights and Measures." This latter subject brought out so much discussion that it was nearly midnight when the meeting was adjourned.

R. ALBRO NEWTON, Secretary.

The Pharmacist and the Law

ABSTRACT OF JUDICIAL DECISIONS.

POISONOUS INGREDIENTS—"INJURIOUS TO HEALTH." The flour bleaching case has resulted in a construction by the United States Supreme Court of sub-division fifth or section 7 of the federal Food and Drugs Act, which reads as follows: "That for the purposes of this act an article shall be deemed to be adulterated * * * Fifth, If it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health." Part of the charge of the federal District Court, excepted to by the milling company, read: "The fact that poisonous substances are to be found in the bodies of human beings, in the air, in potable water, and in articles of food, such as ham, bacon, fruits, certain vegetables, and other articles, does not justify the adding of the same or other poisonous substances to articles of food, such as flour, because the statute condemns the adding of poisonous substances. Therefore the court charges you that the government need not prove that this flour, or foodstuffs made by the use of it, would injure the health of any consumer. It is the character—not the quantity—of the added substance, if any, which is to determine this case." On the other hand, the defendant requested the court to charge the jury substantially that the burden was upon the prosecution to prove that by the treatment of the flour by the Alsop Process it had been caused to contain added poisonous or other added deleterious ingredients, to wit., nitrites or nitrite reacting material, which might render the flour injurious to health; and in that connection that the government must prove that any such added ingredients were of such a character and contained in the flour in such quantities, condi-

tions and amounts "as may render said flour injurious to health." This charge was refused by the District Court. The Circuit Court of Appeals reversed the judgment of the District Court for error in its charge and the Supreme Court has now sustained the decree of the Circuit Court of Appeals and remanded the case to the District Court for a new trial.

The Supreme Court said (Justice Day delivering the opinion), that if the testimony introduced on the part of the milling company was believed by the jury, they must necessarily have found that the added ingredient, nitrites of a poisonous character, did not have the effect of making the consumption of the flour by any possibility injurious to the health of the consumer. "The statute upon its face shows that the primary purpose of Congress was to prevent injury to the public health by the sale and transportation in interstate commerce of misbranded and adulterated foods. The Legislature, as against misbranding, intended to make it possible that the consumer should know that an article purchased was what it purported to be; that it might be bought for what it really was, and not upon misrepresentation as to character and quality. As against adulteration, the statute was intended to protect the public health from possible injury by adding to articles of food-consumption, poisonous and deleterious substances which might render such articles injurious to the health of consumers. * * * The instruction of the trial court permitted the statute to be read without the final and qualifying words, concerning the effect of the article upon health [which may render such article injurious to health]. If Congress had so intended, the provision would have stopped with the condemnation of food which contained any added poisonous or other added deleterious ingredient. In other words, the first and familiar consideration is that, if Congress had intended to enact the statute in that form, it would have done so by choice of apt words to express that intent. It did not do so, but only condemned food containing an added poisonous or other added deleterious ingredient, when such addition might render the article of food injurious to the health. Congress has here, in this statute, with its penalties and forfeiture, definitely outlined its inhibition against a particular class of adulteration.

"It is not required that the article of food containing added poisonous or other added deleterious ingredients must affect the public health, and it is not incumbent upon the government in order to make out a case to establish that fact. The act has placed upon the government the burden of establishing, in order to secure a verdict of condemnation under this statute, that the added poisonous or deleterious substances must be such as may render such articles injurious to health. The word 'may' is here used in its ordinary and usual signification, there being nothing to show the intention of Congress to affix to it any other meaning. It is, says Webster, 'an auxiliary verb,' qualifying the meaning of another verb, by expressing ability, * * * contingency, or liability, or possibility or probability.' In thus describing the offense, Congress doubtless took into consideration that flour may be used in many ways in bread, cakes, gravy, broth, etc. It may be consumed, when prepared as a food, by the strong and the weak, the old and the young, the well and the sick; and it is intended that if any flour, because of any added poisonous or other deleterious ingredient, may possibly injure the health of any of these, it shall come within the ban of the statute. If it cannot by any possibility, when the facts are reasonably considered, injure the health of any consumer, such flour, though having a small addition of poisonous or deleterious ingredients, may not be condemned under the act."

The opinion refers to the view of the English courts construing a similar statute. The English statute provides (§3 of the sale of food and drugs act, 1875): "No person shall mix, color * * * or order or permit any other person to mix, color * * * any article of food with any ingredient or material so as to render the article injurious to health." That section was construed in Hull v. Horsnell, 68 J. P., 591, which involved preserved peas, the color of which had been retained by the addition of sulphate of copper, charged to be a poisonous substance injurious to health. There was a conviction in the lower court. Lord Alverstone, in reversing the case on appeal, held that if the conviction proceeded on the ground that the ingredient mixed with the article of food was injurious to health, and not on the ground that the peas, by reason of the addition of sulphate of copper, were rendered injurious to health, the conviction was clearly wrong. All the cir-

cumstances, he said, must be examined to see whether the article of food has been rendered injurious to health.—*United States v. Lexington Mill & Elevator Co.*, 34 *Sup. Ct. Rep.*, 337.

DIAMOND ANTISEPTIC TABLETS—EXCLUSIVE RIGHT TO NAME AND SHAPE OF. On the ninth of February last, Judge John D. McPherson rendered the following judgment:

"It is therefore adjudged, ordered and decreed that the complainant is entitled to the exclusive use of the name "Diamond" as a trade-mark for antiseptic tablets; and that complainant is entitled to the exclusive use of a diamond-shaped figure representation as a trade-mark for antiseptic tablets; and the complainant is entitled to the exclusive right to the conventional shape of a diamond as a shape for its antiseptic tablets. And it is further adjudged and decreed that the use by the defendants of the word "Diamond" or the representation of a diamond-shaped figure or symbol as in any manner indicating or designating antiseptic tablets, was and is a violation of complainant's rights, and, further, that the manufacture and sale of antiseptic tablets made in the conventional shape of a diamond is a violation of complainant's rights.

"And it is further adjudged and decreed that the defendants, their agents, clerks, workmen, servants and attorneys, perpetually refrain and are hereby perpetually enjoined and restrained, from using the name "Diamond" or the conventional figure of a diamond, to designate antiseptic tablets and, further, from manufacturing, selling or otherwise distributing antiseptic tablets made in violation of complainant's rights, diamond-shaped, or in the conventional form of a diamond.

"It is further adjudged and decreed that defendants surrender and deliver up to complainant, to be destroyed, all labels, signs, prints, bottles, packages, wrappers or receptacles in the possession of defendants bearing the said trade marks or either of them, or any colorable imitation thereof, and likewise all antiseptic tablets in their possession made in violation of complainant's rights, in the shape of a diamond."—*Eli Lilly Co. v. Diamond Pharmacal Co., United States Court for the Eastern Dist. of Pennsylvania.*

FOREIGN CORPORATIONS—"DOING BUSINESS"—FILING COPY OF CHARTER—INTERSTATE COMMERCE. A contract with a medical company, a Minnesota corporation, provided that N. was appointed by the company "as a traveling salesman for its products in the county of M., state of Tennessee," and that the company "agrees to take back all goods left in the possession of the traveling salesman at the time he quits work," and referred to "the expiration of the services of said traveling salesman," etc. A provision on the back of the contract provided that N. was to begin work "as soon as practicable after the goods are received and to work continuously at the agency." During the existence of the agency a note was given by several persons for the agent, to the medical company, for the uncollected price of goods shipped to the agent, namely, $668.01. One of the makers died and in an action for the settlement of his estate in the courts of the State of Kentucky, where the deceased owned real estate, the medical company made a claim for this sum, which was disallowed. Under the statutes of Tennessee every foreign corporation is required to file a copy of its charter with the Secretary of State, and it is unlawful for it to do or attempt to do any business in the state until it shall have complied with the statute. These statutes have been construed in a number of cases in the Tennessee courts, and it has been uniformly held that, where a corporation does business in that state without complying with the statute, all contracts growing out of such business are illegal and invalid. It was held, on appeal, that the medical company was doing business in Tennessee through its agent, N., who was not a mere purchaser of its products.

The medical company contended that its transactions with N. were interstate commerce, and that therefore the note was binding, although it had not complied with the laws of Tennessee. It was held that this defense was not available, under the facts. These products were not ordered by mail and shipped direct to the company's customers. As a matter of fact, they were shipped to Memphis, and from there distributed to its agent, N., and his brother said that he never ordered any goods except from Memphis. The company's witnesses said that the goods were billed to N. in Minnesota, and were merely sent to Memphis for distribution. Even if there were any doubt as to whether or not the interstate journey ended at Memphis, the interstate journey certainly ended

when the goods were delivered to N. Upon their delivery to him their interstate character ceased; and from that time on, N. as the company's agent, proceeded to sell and deliver the goods in Tennessee. The question of the validity of the note was governed by the law of the place where the transaction was had, as well as the place where it was executed, namely, Tennessee, and not by the law of the place of payment.—*Orr's Adm. v. Orr, Kentucky Court of Appeals,* 163 *S. W.,* 757.

SALE OF DRUGS BY ITINERANT VENDORS—PROHIBITION. The United States Supreme Court holds that a state has power, without violating the equal protection or due process of law clauses of the Fourteenth Amendment to the United States Constitution, to forbid the sale by itinerant vendors of "any drug, nostrum, ointment, or application of any kind, intended for the treatment of disease or injury," although allowing the sale of such articles to other persons. The power which the state government possessed to classify and regulate under consideration (Louisiana Laws, 1894, act No. 49, § 12), is held to be cumulatively sustained and made, if possible, more obviously lawful by the fact that the regulation in question deals with the selling by itinerant vendors or peddlers of drugs or medicinal compounds,—objects plainly within the power of government to regulate.—*Baccus v. Louisiana,* 34 *Sup. Ct.,* 439.

SALE OF INTOXICATING LIQUORS—ATTESTATION OF PERMITS. A druggist, carrying on business in a town in Iowa, in making sales of liquors under permits, omitted to attest two of them, as required by Iowa Code, § 2394. In proceedings for violation of the statute it was held that, although there was no bad faith in the omission, the statute had been violated. An active duty is required of the permit holder in each case, and it must be performed in fact, before he can lawfully make the sale.—*McAllister v. Campbell, Iowa Supreme Court,* 145 *N. W.,* 867.

ACTION FOR PRICE—MISBRANDED DRUGS—AGREEMENT TO ADVERTISE. Action was brought for the purchase price of a quantity of patent medicine called "Nott's Melon Seed Kidney Cure." The defenses were that the plaintiff had broken its contract in regard to advertising agreed therein to be done, and also that the goods were misbranded. The trial court instructed the jury that the only question which they could consider was whether the drugs in question were misbranded. It was held, on appeal, that this was error, because it appeared that the plaintiff was not able to carry out the advertising part of the contract as it had agreed, and this evidence should have been submitted to the jury. In regard to the alleged misbranding, it appeared that the defendant was prosecuted by the state for having this misbranded article in its store, and that it was fined $10, and required to pay the costs of the prosecution. It was therefore held that the plaintiff should be required to take back the goods and credit the defendant with the price thereof, in accordance with the terms of the contract of sale.—*Hessig-Ellis Drug Co. v. Harley Drug Co., Nebraska Supreme Court,* 145 *S. W.,* 716.

GASOLINE EXPLOSION—PROXIMATE CAUSE.—An action was brought against the owner of a drug store for injuries to the plaintiff's automobile, caused in the following manner: The plaintiff's son drove the automobile to the defendant's drug store to have it filled with gasoline. After stopping the machine in front of the store and ordering the gasoline, he turned down the light of a lamp, attached to the rear of the automobile about twenty inches under the cap of the tank into which the gasoline was poured, and walked away to talk to some boys. The side of the lamp next to the defendant's store was of metal, so that the light did not show in that direction. The defendant's clerk brought out a five-gallon gasoline can, and, without noticing that the light was burning, placed a funnel in the mouth of the tank, and lifted the can to pour in gasoline, when some of the gasoline ran down, causing an explosion. There was no proof whether the cap on the tank was originally removed by the plaintiff's son or by the defendant's clerk. It was held that the plaintiff's son was negligent in merely lowering the light and removing the tank cap and walking away without explaining to the defendant's clerk that the tank was not ready to be filled. This negligence was a proximate cause of the explosion. Even if the defendant's clerk had been negligent, the plaintiff could not recover, under the rule that where the plaintiff and the defendant are guilty of acts of negligence which together constitute the proximate cause of the injury, then the negligence of the plaintiff, however, slight, bars a recovery.—*Grigsby & Co. v. Bratton, Tennessee Supreme Court,* 163 *S. W.,* 804.

Council Business

COUNCIL LETTER No. 14.

Philadelphia, Pa., April 1, 1914.

To the Members of the Council:

Motion No. 25 (Assignment of Patent Rights to design patent for a Poison Tablet, serial number 801,748, by Norwich Pharmaceutical Company to American Pharmaceutical Association), has received a majority of affirmative votes.

Motion No. 26 (Election of Members). You are requested to vote on the following applications for membership:

No. 55. Frederic Talmage Provost, 1155 Wilson Avenue, Chicago, Ill., rec. by Wm. B. Day and E. N. Gathercoal.

No. 56. Thos. D. Gregg, 1 N. Main St., Harrisburg, Ill., rec. by Wm. B. Day and E. N. Gathercoal.

No. 57. Frederick Fremont Ingram, Jr., 56 10th St., Detroit, Mich., rec. by Caswell A. Mayo and H. M. Whelpley.

No. 58. Alfred Washington Pauley, 3130 N. Girard Avenue, St. Louis, Mo., rec. by H. M. Whelpley and J. A. Wilkerson.

No. 59. George Chalmers Hall, 1422 52d Street, Brooklyn, New York, rec. by J. H. Beal and J. W. England.

No. 60. Reagan Laurence Yeargan, Acme Drug Company, Harriman, Tenn., rec. by E. A. Ruddiman and J. T. McGill.

No. 61. D. Frank Buckley, 688 Salem Street, Malden, Mass., rec. by C. H. Packard and John G. Godding.

No. 62. Burdine H. Carroll, 4734 17th Avenue, North East, Seattle, Wash., rec. by C. W. Johnson and A. W. Linton.

No. 63. F. J. Collinson, Gainesville, Florida, rec. by J. H. Beal and Ernest Berger.

No. 64. Irving Edward Steele, Sergeant, Hospital Corps, U. S. A., Pettit Barracks, Zamboanga, Mind., P. I., rec. by Gabriel Cushman and Arthur Neville.

No. 65. Turner Fee Currens, 57-59 East 11th St., New York, N. Y., rec. by Frank L. McCartney and J. Fred Windolph.

No. 66. Francis Herbert Tapley, 21 Massachusetts Avenue, Boston, Mass., rec. by Anna G. Bagley and John G. Godding.

No. 67. John Francis Correa, Jr., 47 St. Botolph St., Boston, Mass., rec. by Anna G. Bagley and John G. Godding.

No. 68. Charles Garrels, 1110 Fairmont St., Washington, D. C., rec. by H. E. Kalusowski and Henry B. Floyd.

No. 69. Arthur Henry Barnes, Jr., 32 Crown St., Meriden, Conn., rec. by C. H. Packard and Elie H. LaPierre.

No. 70. Maurice Roland Schmidt, Ph.D., 720 W. 181st St., New York City, N. Y., rec. by E. J. Kennedy and Frank L. McCartney.

No. 71. S. Barksdale Penick, 75 Oakland Avenue, Bloomfield, N. J., rec. by William Mansfield and Frank L. McCartney.

No. 72. John Varga, 2017 W. 25th Street, Cleveland, Ohio, rec. by J. H. Beal and J. W. England.

No. 73. Joseph Kepes, 2017 W. 25th Street, Cleveland, Ohio, rec. by J. H. Beal and J. W. England.

No. 74. Bradley Henry Kirschberg, Lorraine Building, Room 10, Schenectady, New York, rec. by J. H. Beal and J. W. England.

No. 75. Mrs. Caroline Wetterstroem, 2844 Colerain Avenue, Cincinnati, Ohio, rec. by Anna G. Bagley and J. H. Beal

No. 76. Edgar Golden Atkins, Savannah, Tenn., rec. by J. O. Burge and J. H. Beal.

No. 77. Henry Osterman, 122 South Walnut, Seymour, Indiana, rec. by J. H. Beal and Carl E. Loertz.

No. 78. Russell Neely Eberly, 2601 Columbia Avenue, Philadelphia, Pa., rec. by J. W. England and Williard Graham.

No. 79. Frank J. Schmeitzer, Jr., 2567 Bank St., Louisville, Ky., rec. by Addison Dimmett and George Eisele.

No. 80. Bert A. Newhall, 3237 Western Parkway, Louisville, Ky., rec. by Addison Dimmett and George Eisele.

No. 81. Harry A. Stutzlen, 387 Springfield Ave., Newark, N. J., rec. by Frank C. Stutzlen and David Strauss.

No. 82. Hugo Edmund Wiedemann, 1105 Holland Bldg., St. Louis, Mo., rec. by H. M. Whelpley and J. C. Falk.

No. 83. Olva L. Waller, 5610 N. Market St., St. Louis, Mo., rec. by O. J. Cloughley and C. T. Buehler.

No. 84. Charles William Emery, Jr., 1901 Franklin Ave., St. Louis, Mo., rec. by J. W. Mackelden and J. A. Wilkerson.

No. 85. Hampton H. Bentz, 1823 South Jefferson Ave., St. Louis, Mo., rec. by J. W. Mackelden and Jacob Lieberstein.

No. 86. Ernest William Rose, 3032 Olive St., St. Louis, Mo., rec. by J. W. Mackelden and J. A. Wilkerson.

No. 87. Frederick W. Wolff, 6th and Washington Ave., St. Louis, Mo., rec. by J. W. Mackelden and E. H. Wolff.

No. 88. Bernard H. Griesedieck, Sarah and St. Louis Ave., St. Louis, Mo., rec. by J. W. Mackelden and Louis Lieberstein.

No. 89. Elmer G. Gerding, 3400 Chippewa St., St. Louis, Mo., rec. by J. W. Mackelden and C. T. Buehler.

No. 90. Charles Harry Biermann, 5110 Page St., St. Louis, Mo., rec. by H. M. Whelpley and J. W. Mackelden.

J. W. ENGLAND,
Secretary of the Council.
415 N. Thirty-third Street.

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COUNCIL LETTER No. 15.

Philadelphia, Pa., April 14, 1914.

To the Members of the Council:

Motion No. 26 (*Election of Members; Applications Nos.* 55 *to* 90, *inclusive*), has received a majority of affirmative votes.

Motion No. 27 (*Election of Members*). You are requested to vote on the following applications for membership:

No. 91. Roland Treiber Lakey, 271 Belvidere Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 92. Emil Bruno Kolbe, 671 Junction Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 93. William H. Allen, Detroit Technical Institute, Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 94. Nathaniel Hugh Jones, 188 Kenilworth, Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 95. Charles S. Elliot, Sgt. 1st Class, Hospital Corps, Reg't Hosp., 23d Infantry, U. S. A., Texas City, Texas, rec. by H. W. Riess and George F. Payne.

No. 96. William J. Remus, 127 LaGrave Ave., Grand Rapids, Mich., rec. by W. C. Kirchgessner and C. H. Packard.

No. 97. Clyde L. Thomas, Grandville, Mich., rec. by W. C. Kirchgessner and C. Herbert Packard.

No. 98. John Perley Regan, Ramblers' Way, North Weymouth, Mass., rec. by Elie H. LaPierre and C. Herbert Packard.

No. 99. George C. Sabin, Grant's Pass, Oregon, rec. by Louis G. Clarke and J. H. Beal.

No. 100. John Werner, Suite 7, Sherbrooke Block, Winnipeg, Canada, rec. by H. E. J. Bletcher and E. Nesbitt.

No. 101. Alexander Campbell, 538 5th Ave., North Saskatoon, Sask., Canada, rec. by H. E. J. Bletcher and E. Nesbitt.

No. 102. Roy L. Connell, Livingston, Mont., rec. by Wm. L. Bomme and F. A. Scheuber.

No. 103. Howard Pinkerton, 81 Grand River Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 104. George W. Crane, 421 Michigan Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 105. Andrew Palmerston Young, 153 Grand River Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 106. C. Raymond Wait, 242 Grand River Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 107. Arthur E. Chantler, 330 Grand River Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 108. Dr. James P. Casey, 424 Woodward Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 109. William Wright Fiero, 417 Woodward Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 110. Harvey S. Bowen, 357 Woodward Ave., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 111. Thomas Alfred Buckland, 9 Municipal Courts Bldg., St. Louis, Mo., rec. by J. C. Falk and H. M. Whelpley.

No. 112. Gustav Rehfeld, 4314 Washington Ave., St. Louis, Mo., rec. by Wm. K. Ilhardt and J. A. Wilkerson.

No. 113. Otto Norbert Speckart, 3342 Franklin Ave., St . Louis, Mo., rec. by Sidney Willette and H. M. Whelpley.

No. 114. John Alphonse Sanger, 4101 St. Louis Ave., St. Louis, Mo., rec. by A. C. Schutte and H. M. Whelpley.

No. 115. Daisy Adelaide Frick, Audubon, Iowa, rec. by Zada M. Cooper and Wilber J. Teeters.

No. 116. Earl B. Putt, 641 Washington St., U. S. Food and Drug Laby., New York, N. Y., rec. by J. H. Beal and G. D. Beal.

No. 117. Thos. Jefferson Draper, Brinkley, Ark., rec. by E. A. Ruddiman and J. T. McGill.

No. 118. Fred A. Barker, 134 Main St., Gloucester, Mass., rec. by Theodore J. Bradley and John G. Godding.

No. 119. Frederic Pratt Brooks, 702 Washington St., Norwood, Mass., rec. by C. Herbert Packard and Theodore J. Bradley.

No. 120. George Henry Hartwell, Main and Central Sts., Southbridge, Mass., rec. by C.Herbert Packard and Theodore J. Bradley.

No. 121. Irving H. Robitshek, 86 S. 10th St., Minneapolis, Minn., rec. by E. L. Newcomb and F. J. Wulling.

No. 122. Theo. Bowie, Grady Hospital, Atlanta, Ga., rec. by George F. Payne and Mrs. M. M. Gray.

No. 123. Richard Calvin Stofer, 28 Hayes St., Norwich, N. Y., rec. by G. M. Beringer and Franklin M. Apple.

J. W. ENGLAND,
Secretary of the Council.
415 N. Thirty-third Street.

COUNCIL LETTER No. 16

Philadelphia, Pa., April 6, 1914.

To the Members of the Council:

The following letter from James H. Beal, under date of April 15, 1914, has been received by J. W. England, Chairman of Committee on Publication, but in view of the peculiar urgency of the situation and the fact that if the Committee on Publication elected an Acting Editor, such action would have to be approved by the Council, and the further fact that the selection of an Acting General Secretary has to be made by the Council itself, it is thought best to bring the whole subject directly before the Council for action:

"I desire to be relieved of my position as Editor and General Secretary at as early a date as convenient, say May 1st, or after the issue of the JOURNAL for that month. My reasons for this you, of course, already know.

During the past winter the attacks from my old enemy have been coming with increasing frequency and severity. A few days of unusual mental or physical stress are sufficient to bring on quite annoying and some rather alarming symptoms.

After careful consideration, and consultation with my medical adviser, I am convinced that the only thing I can do is to free myself entirely from the constant strain and responsibility which are inseparably attached to the position which I hold. By being relieved early this spring, I can live out of doors during the summer, and take such exercise as will enable me to put myself in shape for another winter; but I never expect to be in condition to again take up any work which will confine me to an inflexible schedule of duties.

Your kindness of heart will probably prompt you to suggest that I take a vacation and look forward to resumption of the editorship at some future date, but such an arrangement would not be at all satisfactory, as I could not divest myself of a sense of responsibility, which is the thing above all that I wish to do.

I suggest that the Committee on Publication select Ernest C. Marshall as Acting Editor and Acting General Secretary until the Detroit meeting, which will give plenty of time to settle upon some one for the permanent position. I will keep in close touch with Mr. Marshall, and once relieved of the feeling of responsibility for the JOURNAL, will be able to give him all necessary advice and instructions without worry to myself.

As it would hardly be proper to allow him my salary in addition to his own, would suggest that the Committee pay him for *all of his duties* at the rate of $3,000.00 per year from the time when he takes full charge to the first of September. This would be at the same rate as was allowed me for the same work prior to the Nashville meeting.

If the Committee will take *immediate action*, the matter should be in shape so that I can retire from the work officially not later than the middle of May, or, at the outside, the first of June."

Motion No. 28 (Acceptance of Resignation of James H. Beal as Editor and General Secretary). Do you accept the resignation of James H. Beal as Editor and General Secretary to take effect May 1, 1914, or after the issue of the JOURNAL for that month?

Motion No. 29 (Election of Ernest C. Marshall as Acting Editor and Acting General Secretary). Are you in favor of electing Ernest C. Marshall, at present Advertising Manager of the JOURNAL, as Acting Editor of the JOURNAL and Acting General Secretary of the Association until the annual meeting of the Association at Detroit during the week of August 24 next, the Association to pay him for all of his duties at the rate of three thousand dollars per year from the time when he takes full charge to the first of September?

J. W. ENGLAND,
Secretary of the Council.
415 N. Thirty-third Street.

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UNITED STATES PUBLIC HEALTH SERVICE.

List of Changes of Stations and Duties of Commissioned and Other Officers of the United States Public Health Service for the Period Ending April 15, 1914.

Cofer, L. E., Assistant Surgeon General. Directed to proceed to Boston, Mass., for conference with the medical officer in charge of the Marine Hospital relative to ration issued to patients and attendants. March 20, 1914.

Carter, Henry R., Senior Surgeon. Directed to make necessary trips between Baltimore, Md., and Washington, D. C., for the purpose of giving lectures on malaria and yellow fever to student officers now taking course of instruction at the Hygienic Laboratory. March 21, 1914.

Woodward, R. M., Surgeon. Granted leave of absence for two months from February 3, 1914. March 19, 1914.

Wertenbaker, C. P., Surgeon. Granted four days' leave of absence, on account of sickness, from March 20, 1914. March 24, 1914.

Eager, J. M., Surgeon. Authorized to attend meeting of Permanent Committee of the International Office of Hygiene at Paris, France, beginning April 21, 1914. March 20, 1914.

Nydegger, J. A., Surgeon. Directed to proceed to the Immigration Station, Ellis Island, N. Y., for the purpose of witnessing the various tests there used for the determination of mental development. March 20, 1914.

Lumsden, L. L., Surgeon. Directed to proceed to certain counties in West Virginia and Indiana for investigations of typhoid fever with special reference to rural sanitation. March 18, 1914.

Corput, G. M., Surgeon. Directed to proceed to New Orleans, La., on business connected with procuring supplies for the station when occasion demands, during the period April 1, to June 30, 1914. March 21, 1914.

Goldberger, Jos., Surgeon. Directed to proceed to Richmond, and other points in the state of Virginia, to visit insane and other institutions for the purpose of inquiring into the prevalence and origin of pellagra. March 19, 1914.

Simpson, Friench, Passed Assistant Surgeon. Relieved from duty at San Francisco, Cal., and special duty at Seattle, Wash., and directed to proceed to Washington, D. C., and report to Director, Hygienic Laboratory, for duty in investigation of occupational diseases. March 18, 1914.

Olesen, Robert, Passed Assistant Surgeon. Upon completion of present assignment to the Hygienic Laboratory for instruction, directed to report to the Director for duty. March 18, 1914.

Lanza, A. J., Passed Assistant Surgeon. Upon completion of present assignment to the Hygienic Laboratory, for instruction, relieved from duty at the Fort Stanton Sanatorium and directed to report to the Director for duty. March 18, 1914.

Directed to undertake investigations of the influence of migration of tuberculosis persons in interstate traffic in the states of Arizona and Colorado. March 18, 1914.

Grimm, R. M., Passed Assistant Surgeon. Relieved from duty at the Marine Hospital, Savannah, Ga., and directed to report to the Director, Hygienic Laboratory, for duty. March 18, 1914.

Parcher, George, Assistant Surgeon. Directed to report to the commanding officer of the U. S. Revenue Cutter Miami at Tompkinsville, N. Y., for duty in the ice patrol of the North Atlantic Ocean. March 18, 1914.

Glanville, W. E., Assistant Surgeon. Upon completion of present assignment to the Hygienic Laboratory for instruction, directed to report to the Director for duty. March 18, 1914.

Baughman, D. S., Assistant Surgeon. Relieved from duty at the Marine Hospital, Chicago, Ill., and directed to proceed to Seattle, Wash., and report to Surgeon B. J. Lloyd for duty. March 18, 1914.

Hoskins, J. K., Sanitary Engineer. Directed to proceed to Harrisburg, Pa., for consultation with state health authorities in regard to securing sanitary data for use in investigations of pollution of the Ohio river. March 18, 1914.

Shoub, H. L., Sanitary Bacteriologist. Directed to proceed to Washington, D. C., and report to the Director of the Hygienic Laboratory for duty in connection with field investigations of stream pollution. March 18, 1914.

Sharpe, W. K., Jr., Epidemiologist. Granted two days' leave of absence en route to Washington, D. C. March 21, 1914.

Stoner, G. W., Senior Surgeon. Granted five days' leave of absence from March 21, 1914, under paragraph 193, Service Regulations. March 26, 1914.

Wertenbaker, C. P., Surgeon. Relieved from duty at Norfolk, Va., and directed to proceed to Providence, R. I., not later than May 1, 1914, and assume charge of the Service at that port. March 24, 1914.

Grubbs, S. B., Surgeon. Relieved from duty at Providence, R. I., upon arrival of Surgeon C. P. Wertenbaker, and directed to proceed to Louisville, Ky., and assume charge of the Service at that port. March 24, 1914.

Lumsden, L. L., Surgeon. Referring to Bureau orders of March 18, 1914, directed while conducting investigations of rural sanitation in West Virginia to return to Washington, D. C., at intervals of at least two weeks for conference and to make bacteriological examinations of specimens collected. March 28, 1914.

Goldberger, Joseph, Surgeon. Directed, in connection with investigations of pellagra, to proceed at such times as may be necessary to Catlett, and other places in the State of Virginia, to make epidemiological studies of cases of the disease. March 27, 1914.

McLaughlin, A. J., Surgeon. Granted six months' leave of absence from April 1, 1914, without pay. March 27, 1914.

Pierce, C. C., Surgeon. Upon completion of the course of instruction at the Hygienic Laboratory, directed to report to the Bureau for duty in connection with the preparation of a Service exhibit for the Panama-Pacific Exposition. March 25, 1914.

Frost, W. H, Passed Assistant Surgeon. Authorized, in conjunction with Sanitary Chemist H. W. Streeter, to present before the section on water, sewage and sanitation of the American Chemical Society an outline of the work being carried on in the investigation of the pollution of the Ohio River and the Laboratory work in connection therewith. March 25, 1914.

Paine, Liston, Assistant Surgeon. Relieved from duty at the Marine Hospital, Boston, Mass., and directed to proceed to Cincinnati, Ohio, and report to Passed Assistant Surgeon W. H. Frost for duty in the investigations of the pollution of the Ohio River. March 26, 1914.

Ruoff, John S., Assistant Surgeon. Granted one month and seven days' leave of absence, on account of sickness, from February 24, 1914.

Stiles, C. W., Professor of Zoology. Detailed at the request of the Eighth District Medical Society of North Carolina, to attend the annual meeting of that society, to be held at Greensboro, N. C., April 2-3, 1914, and present an address on a public health subject of general interest. March 24, 1914.

Phelps, E. B., Professor of Chemistry. Detailed to attend the meeting of the American Chemical Society, to be held at Cincinnati, Ohio, April 7-10, 1914, for the purpose of presenting a paper on chemical studies of the pollution of the Ohio River. March 31, 1914.

Seidell, Atherton, Technical Assistant. Detailed to attend the meeting of the American Chemical Society to be held at Cincinnati, Ohio, April 7-10, 1914, for the purpose of presenting a paper before the pharmaceutical section of the society. March 31, 1914.

BOARD CONVENED.

Board of commissioned medical officers convened to meet at the Bureau, Monday, April 27, 1914, at 10 o'clock a. m., for the physical and mental examination of candidates to determine their fitness for appointment as Assistant Surgeons in this Service. Detail for the board: Assistant Surgeon-General W. G. Stimpson, chairman; Assistant Surgeon-General W. C. Rucker, member; Passed Assistant Surgeon Hugh de Valin, recorder. March 27, 1914.

Williams, L. L., Surgeon. Granted one day's leave of absence, on account of sickness, March 26, 1914. April 4, 1914.

Guiteras, G. M., Surgeon. Granted three days' leave of absence, on account of sickness, March 22, 1914. April 4, 1914.

Brown, B. W., Surgeon. Granted one month's leave of absence to date from arrival in San Francisco, Cal. April 3, 1914.

Clark, T., Surgeon. Directed to proceed to the states of West Virginia and Virginia for the purpose of completing investigations of the prevalence of trachoma and other infectious diseases among the mining and mountainous population of those states. April 3, 1914.

Directed to proceed to Huntington, W. Va., for the purpose of addressing the public health meeting to be held in that city, April 3, 1914. April 6, 1914.

Anderson, John F., Surgeon. Directed to proceed to Toronto, Can., for the purpose of attending the annual meeting of the American Association of Pathologists and Bacteriologists to be held in that city April 9-11, 1914. Also returning, to stop in New York, N. Y., for the purpose of attending the annual meeting of the Commission of Milk Standards, April 13, 1914. April 2, 1914.

Schereschewsky, J. W., Surgeon. On request of the Joint Board of Sanitary Control of the Garment Trade and the Commissioner of Health of New York, directed to proceed to New York, N. Y., and conduct, in co-operation with the above agencies, an invertigation into the sanitary condition of the garment workers' trade and the physical status of employes engaged therein. April 7, 1914.

Warren, B. S., Surgeon. On request of the State Board of Health of Louisiana, directed to proceed to New Orleans in time to attend a conference upon April 20, 1914, of local and state health officers, mayors, and other authorities relative to public health work, with particular reference to the sanitary inspection and regulation of public buildings and places of public assembly. April 2, 1914.

Creel, R. H., Passed Assistant Surgeon. Directed to proceed immediately to Havana, Cuba, on account of plague infection at that port. April 6, 1914.

Collins, G. L. Passed Assistant Surgeon. Granted two days' leave of absence, on account of sickness, March 28 and March 30, 1914. April 3, 1914.

Spratt, R. D., Passed Assistant Surgeon. Upon the request of the Secretary of Labor, directed to proceed, at the first convenient opportunity, to Wheeling, W. Va., for the purpose of making a re-examination of aliens Sada and Barbara Nassif. April 2, 1914.

Frost, W. H., Passed Assistant Surgeon. Granted two days' leave of absence, March 29-30, 1914, under paragraph 193, Service Regulations. April 2, 1914.

Simpson, Friench, Passed Assistant Surgeon. Directed to proceed to New York, N. Y., for duty under Surgeon J. W. Schereschewsky, in connection with investigations of the sanitary conditions of garment workers' trades and the physical status of employes engaged therein. April 7, 1914.

Bryan, W. M., Passed Assistant Surgeon. Relieved from duty at the Marine Hospital at Stapleton, N. Y., and directed to proceed to Washington, D. C., and report to the Director of the Hygienic Laboratory for duty; then to proceed to Martinsburg, W. Va., and report to Surgeon L. L. Lumsden for duty in field investigations of typhoid fever. April 6, 1914.

Olesen, Robert, Passed Assistant Surgeon. Directed to proceed to New York, N. Y., for duty under Surgeon J. W. Schereschewsky, in connection with investigations of the sani-

tary conditions of garment workers' trades and the physical status of employes engaged therein. April 7, 1914.

Lanza, A. J., Passed Assistant Surgeon. Directed, upon request of the Secretary of the Interior, in connection with Bureau order of March 18, 1914, to make sanitary investigations of metal mines at Butte, Mont., and Cripple Creek, Col., and vicinity, also of the mining industry in Arizona with special reference to "Miners' asthma." April 3, 1914.

In carrying out above order, directed to proceed by way of Franklin Furnace, N. J., for the purpose of inspecting the sanitation of the mines located there, and Pittsburgh, Pa., to become familiar with the operations of the laboratory maintained by the Bureau of Mines. April 7, 1914.

Ridlon, J. R., Passed Assistant Surgeon. Directed in connection with the investigations of pellagra to assume charge of the Marine Hospital at Savannah, Ga. April 6, 1914.

Watkins, J. A., Assistant Surgeon. Relieved from duty in the Hygienic Laboratory, and on request of the Secretary of the Interior, directed to proceed to Pittsburgh, Pa., for the purpose of making investigations of the sanitary conditions of metallurgical plants in the Pittsburgh district, as they affect the health of employes. April 3, 1914.

Knox, H. A., Assistant Surgeon. Granted 11 days' leave of absence on account of sickness, from March 17, 1914. April 4, 1914.

Glanville, W. E., Assistant Surgeon. Relieved from duty at the Hygienic Laboratory, and directed to proceed to San Francisco, California, and report to the Medical Officer in charge of the quarantine station for duty, and assignment to quarters. April 6, 1914.

Thometz, H. M., Assistant Surgeon. Directed to proceed to Seattle, Washington, about April 20, 1914, and report to the commanding officer of the Revenue-Cutter "Tahoma" for duty during the summer cruise in Alaskan waters. April 6, 1914.

Treadway, W. L., Assistant Surgeon. Granted 15 days' leave of absence from April 4, 1914. April 4, 1914.

Stiles, C. W., Professor of Zoology. Detailed to attend the meeting of the South Carolina Medical Association at Florence, S. C., April 15-16, 1914. April 3, 1914.

Voegtlin, Carl, Professor of Pharmacology. Directed to proceed to Catlett, Va., for the purpose of collecting material and securing data for use in connection with investigations of pellagra. April 3, 1914.

Wells, W. F., Sanitary Chemist. Directed to proceed to Cumberland, Md., and vicinity for the purpose of making chemical and bacteriological analyses of samples of water in connection with investigations of the pollution of the Potomac River. April 4, 1914 .

Kerr, J. W., Assistant Surgeon-General. Directed to proceed, by way of Providence, R. I., to Boston, Mass., for consultation with the state authorities regarding methods of sanitary administration. April 9, 1914.

Rucker, W. C., Assistant Surgeon-General. Directed to proceed to Baltimore, Md., on April 14, 1914, for the purpose of delivering a stereopticon lecture on the subject of "Bubonic Plague." April 10, 1914.

Clark, T., Surgeon. Detailed to attend the meeting of the Virginia Public Health Association, to be held at Charlottesville, Va., April 23, 1914, for the purpose of presenting a paper on trachoma. April 13, 1914.

von Ezdorf, R. H., Surgeon. Detailed to attend the meeting of the section on Malaria Eradication of the National Drainage Congress in Savannah, Ga., April 22-25, 1914, for the purpose of presenting a paper describing present and contemplated governmental activities in relation to malaria investigations. April 13, 1914.

Fox, Carroll, Surgeon. Granted one day's leave of absence April 14, 1914. April 11, 1914.

Pierce, C. C., Surgeon. Directed to proceed to New York, N. Y., for the purpose of investigating a closet-closing device now operating on certain railroads; also while in New York to visit such places as may be necessary, to collect information which may be of assistance in the preparation of the Service exhibit at the Panama-Pacific International Exposition. April 11, 1914.

Glanville, W. E., Assistant Surgeon. Directed to report, April 20, 1914, to the commanding officer of the Revenue-Cutter "Bear" at San Francisco, Cal., for duty during the summer cruise in Alaskan waters. April 10, 1914.

Jenkins, Luther W., Assistant Surgeon. Directed to report, April 15, 1914, to the commanding officer of the Revenue-Cutter "Manning" at San Francisco, Cal., for duty during the summer cruise in Alaskan waters. April 7, 1914.

Derivaux, R. C., Assistant Surgeon. Directed to proceed, when directed by Surgeon R. H. Von Ezdorf, to points in the South, particularly in the States of Arkansas, Mississippi, South Carolina and Tennessee for the investigation of the prevalence of malaria and the collection of pathological material and specimens of mosquitoes. April 13, 1914.

Treadway, W. L., Assistant Surgeon. Granted two days' additional leave of absence from April 19, 1914. April 14, 1914.

Crane, J. F., Acting Assistant Surgeon. Granted seven days' leave of absence from April 10, 1914. April 10, 1914.

Marsh, W. H., Acting Assistant Surgeon. Granted four days' leave of absence from April 27, 1914. April 11, 1914.

Smith, E. E., Sanitary Bacteriologist. Directed, when instructed by the medical officer in charge of the investigations of the pollution of the Ohio River, to proceed to such points on the Ohio River watershed, as he may designate, for the purpose of collecting samples, of water, making sanitary surveys, and laboratory investigations. April 9, 1914.

Veldee, Milton V., Sanitary Bacteriologist. Directed, when instructed by the medical officer in charge of the investigations of the pollution of the Ohio River, to proceed to such points on the Ohio River watershed as he may designate, for the purpose of collecting samples of water, making sanitary surveys, and laboratory investigations. April 9, 1914.

Official: RUPERT BLUE,
Surgeon-General.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

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Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

<>

BRIGGS, A.,
From 204 Bowitzer Pl., Richmond, Va.
To 204 Howitzer Pl., Richmond, Va.

BLANK, H. G.,
From 5132 Coral St., Pittsburgh, Pa.
To Springdale, Pa.

DAVIS, C. R.,
From 30 State St., Bangor, Me.
To 24 State St., Bangor, Me.

DAILY, A. D.,
From Frisco Hospital, St. Louis, Mo.
To Sherman, Texas.

ECKLER, C. R.,
From 535 Northern Ave., Indianapolis, Ind.
To 335 Northern Ave., Indianapolis, Ind.

EISENMAN, F. J.,
From H. C., U. S. A., Fort Wm. McKinley (Manila), P. I.
To Department Hospital, Manila, P.I.

GIBSON, F. L.,
From U. S. P. H. and M. H. Service, Kalawao, Hawaii, H. I.
To 4141 Clarenden Ave., Chicago, Ill.

HAYS, F. B.,
From 100 William St., New York, N. Y.
To Oxford, N. C.

LEE, O. W.,
From 54 E. 50th St., 1st Apt., Chicago, Ill.
To 6 5th Ave., LaGrange, Ill.

OTIS, J. F.,
From Clarion and Montgomery Sts., Cincinnati, O.
To s. w. cor. Ruth and Gilbert Sts., Cincinnati, O.

PEARSON, J. F.,
From Cumberland Court, Annapolis, Md.
To 272 King and George Sts., Annapolis, Md.

WILKERSON, J. A.,
From 14th and Madison St., St. Louis, Mo.
To 2213a St. Louis Ave., St. Louis, Mo.

YOUNG, HARRY C.,
From 7939 Maderia St., Pittsburgh, Pa.
To 309 Harrison Ave., Avalon, Pa.

ZEMAN, OTTO,
From 3909 W. 26th St., Chicago, Ill.
To cor. 30th and Central Park Ave., Chicago, Ill.

THE PRICE CUTTER.

A great obstacle to honest constructive effort is the *Price Cutter*. Next in line comes the blackguard who *encourages* the price-cutting and endeavors to force all competitive effort down to the dead level of mediocrity.

We met one of his ilk the other day. "What," says he, "you charge $2.50 for that job when Faket charges only a dollar! You're a robber!" Yes, Faket does do it for a dollar and it may be as well done as my $2.50 job. The difference is that Faket is a *one dollar man* while I'm a $2.50 man. In this free country there is nothing to keep that blackguard from going to Faket, but in trying to bulldoze me down to Faket's level he violates all decency. I have the indisputable right to place my own value upon my own time and services. Why will one perform a laparotomy for $50 while another asks $500? It is generally a matter of individual attainment. The $50 man has only a $50 reputataion at stake, while the $500 man assumes $500 worth of responsibility. The $450 difference can often be accounted for in the cheap man's lack of experience; lack of professional standing and pride; financial stress, or lack of moral stamina to ask an honest price for an honest job.

It is an odd commentary upon human nature that the man who hammers down the price is the first to raise a howl when his own toes are trod upon. He exacts the last farthing, but *you* must always make concessions. Keen competition has fixed a fairly stable price on all forms of human endeavor, as well as on commodities. These prevailing prices take into account a great many economic factors.

In the case of merchandise there must be added to the actual cost of the article, the merchant's overhead expense, which includes rent, salaries, investment, insurance, losses in deterioration and bad accounts, telephone, lighting, freight, advertising, etc., etc. If an article costs the dealer seventy-five cents, he does not "break even" until he has added on twenty-five percent or more of operating cost. This accounts for the difference in the price listed by producers and the *cost* price charged by the dealer.

As a rule staple articles allow a margin just sufficient to cover this "overhead" expense and a small excess as profit. Therefore, the man who "cuts" on such staple articles is bound to be an impostor, for the reason that he is compelled to make the difference good on merchandise, the value of which is unknown to the purchaser.

In the case of skilled labor or professional services, the factors of individual attainment and the law of supply and demand apply. A student out of college will give his services for a fraction of what he will demand later in his experience. He has no moral right to exact a *fancy price* for his services. The apprentice is not entitled to the same emolument as the master workman, although he may perform a given piece of work quite as creditably.

The Price Cutter will continue to have his following, but competition and achievement are entitled to other considerations than arbitrary calculation of dollars and cents. It is some consolation to those who have been imposed upon to know that the "cut-throat" must eventually come to grief.—*California State Journal of Medicine.*